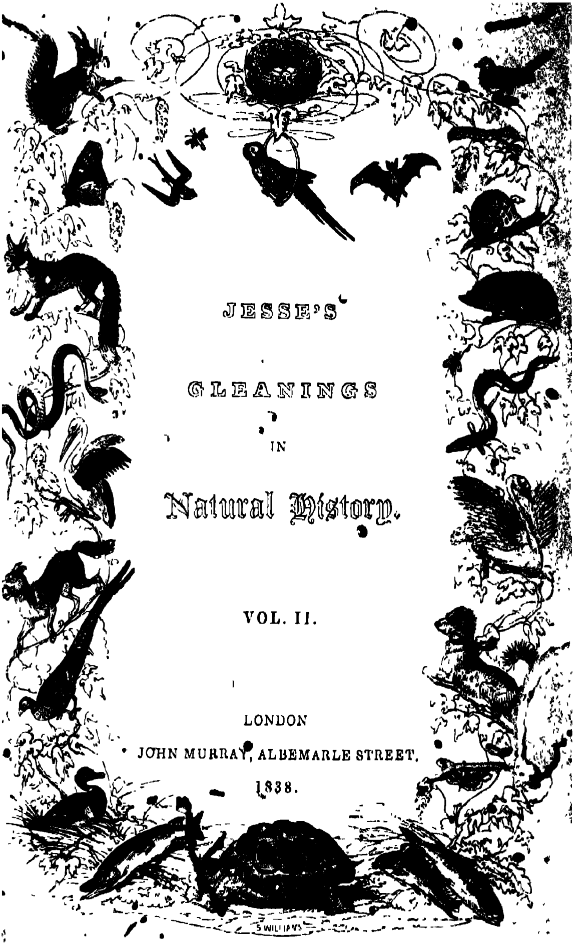


JESSE'S

GLEANINGS

IN

Natural History.

VOL. II.

LONDON
JOHN MURRAY, ALBEMARLE STREET.
1838.

GLEANINGS

IN

NATURAL HISTORY

BY

EDWARD JESSE, Esq. F.L.S.

SURVEYOR OF HER MAJESTY'S PARKS, PALACES, &c.

Not a tree,
A plant, a leaf, a blossom, but contains
A folio volume. We may read, and read,
And read again, but still find something new,
Something to please, and something to instruct,
E'en in the noisome weed.

A NEW EDITION IN TWO VOLUMES.

VOL. II.

LONDON:
JOHN MURRAY, ALBEMARLE STREET.
MDCCCXXXVIII.

PRINTED BY W. NICOL, PALL-MALL.

CONTENTS.

VOL. II.

CONTENTS.

GLEANINGS

IN

NATURAL HISTORY.

> 'O blind to Nature's all accordant plan,
> 'Think not the war-song is confin'd to man.
> 'In shrill defiance, ere they join the fray,
> 'Robin to Robin chaunts the martial lay.' ANON.

I HAD an opportunity this summer of witnessing the distress of a Robin, which, on returning to her nest with food for her young, discovered that they had disappeared. Her low and plaintive wailings were incessant. She appeared to seek for them among the neighbouring bushes, now and then changing her mournful cry into one which I fancied was a call to her brood to come to her. She kept the food in her mouth for a short time, but when she found that her cries were unanswered, let it fall to the ground. There was something affecting in this little incident, which has also been remarked by the 'Poet of Nature' in the case of a Nightingale, and is thus beautifully described:

> 'the Nightingale - - -
> - - when returning with her loaded bill,
> 'The astonished mother finds a vacant nest,

'By the hard hands of unrelenting clowns
'Robb'd; to the ground the vain provision falls;
'Her pinions ruffle, and, low drooping, scarce
'Can bear the mourner to the poplar shade;
'Where, all abandon'd to despair, she sings
'Her sorrows through the night; and on the bough
'Sole sitting, still at every dying fall
'Takes up again her lamentable strain
'Of winding woe; 'till wide around, the woods
'Sigh to her song, and with her wail resound.'

THOMSON—Spring.

It is impossible to read these lines without being struck with a similar description in Virgil, or with the beautiful and concise manner in which he relates it.

'Qualis populeâ mœrens philomela sub umbrâ
'Amissos queritur fœtus, quos durus arator
'Observans nido implumes detraxit at illa
'Flet noctem, ramoque sedens, miserabile carmen
'Integrat, et mœstis late loca questibus implet.'

VIRG. Georg. 4th Book.

The affection which birds shew for their young is very remarkable, and the affection seems to be reciprocal. When a bird returns to the nest to impart warmth to her brood, she is received with a chirp of pleasure and love. I have observed this to be the case more particularly with Swallows. When the parent bird settles in her nest for the night, I can hear the young keeping up a little *satisfied* note of gratification, which seems to continue till very late in the evening.

The warmth and protection which birds receive

from their parent is beautifully illustrative of the security afforded by a superintending Providence to those who apply to him for help: 'He shall cover 'thee with his feathers, and under his wings shal't 'thou trust.' To my feelings there is not in the whole Bible a more elegant or delightful metaphor than this, or one which the human mind, especially when in a state of affliction and distress, may dwell upon with greater comfort and satisfaction. When I have seen a bird of prey hovering over some newly hatched chickens, and perceived them run for shelter under the wings of their parent, I am forcibly reminded that in the hour of danger and temptation I may fly, by prayer, to my heavenly Father, for refuge and protection. Those who have made the works of creation their study, will have had many opportunities of appreciating the truth of the remarks, I have ventured from time to time to make, respecting the lessons of instruction which may be derived from the delightful contemplation of the various objects with which we are perpetually surrounded.

Let me now return to the subject of this chapter, and give an instance or two of the love of animals for their young.

A Cat in this neighbourhood was observed on the top of a paledfence, endeavouring to get at a Blackbird's nest which was near it; the hen left the nest on her approach, and flew to meet her in a state of great alarm, and placed herself almost within her reach, uttering the most piteous screams of wildness and despair. The cock bird on perceiving the at-

tempt, shewed the greatest distress, and uttered loud screams and outcries, sometimes settling on the fence just before the cat, who was unable to make a spring in consequence of the narrowness of its footing. After a little time, the cock bird flew at the cat, settled on her back, and pecked her head with so much violence, that she fell to the ground followed by the black-bird, who succeeded in driving her away. On a second occasion the same scene occurred, in which the black-bird was victorious, when the cat became so intimidated at the attacks made upon her, that she gave over her attempts to get at the young ones after each battle the black-bird celebrated his victory with a song, and for several days afterwards he would hunt the cat about the garden whenever she left the house. I also knew an instance of a pair of black-birds following a boy into a house, and pecking at his head while he was conveying one of their young ones into it.

People indeed little think what misery and anxiety they occasion to birds when they deprive them of the brood which they have been cherishing with so much tenderness and affection. I remember the following passage in an old author. 'The cruel parent that 'would encourage his childe to deprive a poor birde 'of her young broode, right well deserveth to have 'his own nest robbed, and to become childless.'

Put young birds in a cage, and under every change of place and circumstance they will be followed and fed with the utmost care and punctuality by the old ones; and this care will be shewn for a much longer

period of time than if they had been reared in the usual manner. I have often watched the anxiety and distress which birds have exhibited when I have lingered near the nest that contained their young. Their uneasiness cannot be mistaken, and the most timid will then shew a degree of boldness and a carelessness of their own safety, which is not a little to be admired. It may be traced downwards from the eagle to the wren, and again, from the swan to the most minute of our aquatic birds. One of the latter tribe, the Moor-hen, displays sometimes a degree of foresight in her care for her young, which is particularly pleasing. It is well known that she builds her nest amongst sedges and bull-rushes, and generally pretty close to the water, as it is there less likely to be observed. In places, however, where anything like a flood is likely to take place, a duplicate nest, more out of the reach of the water is constructed, which is intended to be in readiness in case a removal of the eggs or young ones should be found necessary. This observation was made by a family residing at an old Priory in Surrey, where moor-hens abound, and where the fact was too often witnessed by themselves and others to leave any doubt of its accuracy.

I have frequently observed a duplicate nest unoccupied near the one in which the White-throat has deposited her eggs, and generally in a more exposed situation than the latter. For what reason this second nest is built I cannot conjecture, except it were for the purpose of deception.

Birds, especially those which are familiar with mankind, frequently choose odd situations for building in. A Robin lately began its nest in a myrtle, which was placed in the hall of a house belonging to a friend of mine in Hampshire. As the situation was considered rather an exceptionable one, the nest was removed. The bird then began to build another on the cornice of the drawing room, but as this was also objected to for obvious reasons, it was not allowed to be completed. The Robin, thus baffled in two attempts, began a third nest in a new shoe, which was placed on a shelf in his dressing-room. Here it was permitted to go on with its work until the nest was completed; but as the new shoe was likely to be wanted, and as it would not be benefitted by being used as a cradle for young birds, the nest was carefully taken out, and deposited in an old shoe, which was put in the situation of the new one. Here what remained to be done to the nest was completed; the under part of the shoe was filled up with oak-leaves, the eggs were deposited in the nest, and in due time hatched, the windows of the room being always left a little open for the entrance and egress of the birds. My friend informed me that it was pleasing to see the great confidence the Robins placed in him. Sometimes, while he was shaving in the morning, the old birds would settle on the top of his glass, having worms in their mouths, nor did they appear in the least alarmed at his presence.

I have heard of a pair of Robins having built their nest in a pew of the church of Burton-upon-Trent,

and was informed that the process of incubation and feeding the young went on uninterruptedly, even when persons were in the pew during divine service. 'The sweet poet of Israel' has indeed remarked the partiality of birds for the sanctuary in most beautiful strains, and many persons must have observed the Red-breast in particular flitting over the heads of a congregation in our parochial churches. One of them for several successive years resorted to the church at Dudley in Staffordshire, and its warbling notes were frequently heard amidst the tones of the organ and the voices of the people. At last its visits were discontinued, to the no small regret of many of the congregation. A few years afterwards, when the organ was taken down to be cleaned, the skeleton of the Red-breast was discovered in one of the pipes, its favourite station having been the summit of the instrument.

In speaking of the Robin I may observe, that when they sing late in the autumn it appears to be from rivalship, and that there are always two singing at the same time. If one of them is silenced the other immediately ceases its song. I observe also that they always sing while they are preparing to fight with each other. The Red-breast is indeed a very pugnacious bird, of which I lately observed an instance. Two of them, after giving the usual challenge, fought with so much animosity, that I could easily have caught them both as they reeled close to my feet on a gravelled walk. After some time one of them had the advantage, and would have killed his opponent

had they not been separated. Indeed these birds will frequently fight till one has lost his life. It has been asserted that the female Robin sings, and I am much inclined to be of this opinion, having heard two Robins sing at the same time in a situation where I had every reason to believe there was only one pair. This was an insulated garden on the banks of the Thames.

'Parrots in general, have striking peculiarities in their 'manners. Both sexes readily learn to pronounce words.'

BLUMENBACH.

ALMOST every one has heard of Colonel O'Kelly's Parrot. There is one however which is occasionally brought from Brighton to Hampton Court, that appears to equal it in intelligence and power of imitation. I had seen and heard so much of this bird, that I requested the sister of its owner to furnish me with some particulars respecting it, and I now give the account in her own agreeable manner of stating it. I will only add that its accuracy need not be doubted.

"As you wished me to write down whatever I could collect about my sister's wonderful parrot, I proceed to do so, only promising that I will tell you nothing but what I can vouch for having myself heard. Her laugh is quite extraordinary, and it is impossible not to help joining in it oneself, more especially when in the midst of it she cries out 'don't 'make me laugh so, I shall die, I shall die;' and then continues laughing more violently than before. Her crying and sobbing are curious, and if you say poor Poll, what is the matter? she says 'so bad, so 'bad, got such a cold;' and after crying for some time will gradually cease, and making a noise like drawing a long breath, say 'better now,' and begin to laugh.

"The first time I ever heard her speak was one day when I was talking to the maid at the bottom of the stairs, and heard what I then considered to be a child call out 'Payne,' (the maid's name,) 'I am not well, I'm not well:' and on my saying, 'what is 'the matter with that child?' she replied, 'it is only 'the parrot, she always does so when I leave her 'alone, to make me come back;' and so it proved, for on her going into the room the parrot stopped, and then began laughing quite in a jeering way.

"It is singular enough, that whenever she is affronted in any way she begins to cry, and when pleased, to laugh. If any one happens to cough or sneeze, she says 'what a bad cold.' One day, when the children were playing with her, the maid came into the room, and on their repeating to her several things which the parrot had said, Poll looked up and said quite plainly 'no I did'nt.' Sometimes, when she is inclined to be mischievous, the maid threatens to beat her, and she often says 'no you won't.' She calls the cat very plainly, saying, 'Puss, Puss,' and then answers *mew*; but the most amusing part is, that whenever I want to make her call it, and to that purpose say Puss, Puss, myself, she always answers *mew* till I begin mewing, and then she begins calling Puss as quick as possible. She imitates every kind of noise, and barks so naturally that I have known her to set all the dogs on the parade at Hampton Court barking; and I dare say, if the truth was known, wondering what was barking at them; and the consternation I have seen her cause in a

party of cocks and hens, by her crowing and clucking, has been the most ludicrous thing possible. She sings just like a child, and I have more than once thought it was a human being; and it is most ridiculous to hear her make what one should call a false note, and then say 'Oh la,' and burst out laughing at herself, beginning again quite in another key. She is very fond of singing 'Buy a Broom,' which she says quite plainly; but in the same spirit as in calling the cat, if we say, with a view to make her repeat it, Buy a Broom, she always says 'Buy a *Brush,*' and then laughs as a child might do when mischievous. She often performs a kind of exercise which I do not know how to describe, except by saying that it is like the lance exercise. She puts her claw behind her, first on one side and then on the other, then in front, and round over her head, and whilst doing so keeps saying, 'come on, come on;' and when finished, says 'bravo, beautiful!' and draws herself up. Before I was as well acquainted with her as I am now, she would stare in my face for some time and then say 'How d'ye do, ma'am?' this she invariably does to strangers. One day I went into the room where she was and said, to try her, 'Poll, where is Payne 'gone?' and to my astonishment, and almost dismay, she said 'down' stairs.' I cannot at this moment recollect any thing more that I can vouch for myself, and I do not chuse to trust to what I am told, but from what I have myself seen and heard she has almost made me a believer in transmigration."

In addition to this account, I may mention that

the Rev. Dr. Hooker of Rottingdean, near Brighton, has a Parrot which evinces almost equal sagacity. If a piece of tape is given it, it weaves it into a sort of basket, and will tie a knot with its beak and foot.

'When the moon is on the wave,
'And the glow-worm in the grass,
'And the meteor on the grave,
'And the wisp on the morass.

'When the falling stars are shooting,
'And the answering owls are hooting;
'And the silent leaves are still
'In the shadow of the hill. BYRON.

I INVARIABLY experience a variety of sensations when I 'survey the heavens' on a calm clear night, about the end of the month of May. I can then inhale the sweets of the wood-bine and other flowers, whose fragrance is drawn out by the gentle dews of evening. The Nightingale breaks the silence by his sweet and varied notes; and the full moon, 'walking in brightness,' and rendered still more beautiful by the lustre of so many shining stars, which appear in the wide extended firmament, completes the loveliness of this nocturnal scene. Then I begin to reflect upon my own insignificance, and to ask myself what am I, that the great Author of the universe should be mindful of me. His mercy however then presents itself to me as well as His majesty, and the former affects me more than the latter. I listen to the bird which appears to be pouring forth its little tribute of gratitude and praise, and my heart prompts me to do the same. The very perfume of the flowers seems to be an in-

cense ascending up to heaven; and with these feelings I am able to enjoy the calm tranquillity of the evening. The distant lowing of the oxen, the tinkling of a sheep-bell, the well known cry of the corn-crake, disturb the silence and remind me where I am. Beneath the gloom of a large spreading oak, I can now and then discover the Fern-owl, or Night-jar, as it hawks for moths or cockchaffers, sometimes amongst the branches of the tree, and at others nearer the ground. The Bat flies past me with a silence and rapidity which prevents my watching its motions, and on the dead branch of an old decayed elm, an owl settles and utters his melancholy note. Such is the scene of a peaceful night in the country.

I have great pleasure in watching the movements of the Fern-owl. In the twilight it appears an active and valorous bird, shewing some symptoms of menace to those who then approach its haunts; but if it is disturbed in the day-time, it takes a short flight, and appears solitary and listless. I have generally found it in some little dell or tangled copse, perching on the dead branch of a tree, as near as possible to the ground, and not appearing intimidated by my approach.* Like the Falco Apivorus, or Honey Buzzard,

* This circumstance has led me to suppose that it can only see well, like the common owl, at night. Mr White supposes that it is the only insectivorous bird which takes its prey with its feet when flying. The Titmouse, however, does so, at least I have thought that I have discovered it doing so. It is however difficult to decide accurately on the rapid motions of so small a bird. Mr. White thinks that the Fern-owl picks the

it seems to be one of nature's links, having some analagous conformations with that bird, and appearing to connect the rapacious and the insectivorous birds.

The Bat is another link in nature, and its habits are very curious. We have 15 varieties of them in this country, though our British Fauna notices only 7, and they are certainly deserving of more attention than they have hitherto received. Some species of Bats are not torpid all winter. They are out at all times during the winter months except in frost.

I like also to watch the silent flight of the Owl on a summer's evening along a range of meadows, sometimes seeking its prey by the side of a ditch, and at others near a hedge-row. The common brown or tawny Owl (Strix Stridula) is frequently found in the old oak pollard trees in Richmond Park, generally those which have some ivy about them. Indeed these birds are only, I believe, found amongst woods; while the White Owl (Strix Flammea) shelters itself in barns and old buildings, and is the bird whose hooting or screeching is so well known.

> ——' The howlet mourns in her ivy bower,
> ' And tells the midnight moon her care. BURNS.

Owls probably do not require water, as they suck the juices from their prey, and then reject the indi-

insects to pieces as she flies along, and so pouches them for the young. The solstitial chaffer is their favourite prey. The serrated claw of this bird is on the longest toe.

gestible parts. This may account for their bodies being so light and bare of flesh.

The Rev. Mr. Bree, of Allesley, near Coventry, whose agreeable communications in Loudon's Natural History have afforded me both pleasure and information, relates a fact respecting the common brown Owl, which is quite new to me, (as it will probably be to many of my readers.) He says that this bird, occasionally at least, is in the habit of feeding its young with live fish, a circumstance which he had ascertained beyond a doubt. Some years since several young Owls were taken from the nest, and placed in a yew tree in the Rectory garden. In his situation the parent birds repeatedly brought them live fish, (bull-heads and loach,) which had doubtless been procured from the neighbouring brook, in which these species abound. Since the above period, Mr. Bree says that on more than one occasion he had found the same fish, either whole or in fragments, lying under the trees on which he had observed the young owls to perch after they had left the nest, and where the old birds were accustomed to feed them. He adds, that it has always been a wonder to him by what method the Owl contrives to capture the fish, being apparently a bird peculiarly unfitted for piscatory depredations.

Another correspondent confirms the fact, which he says corroborates a declaration made by a labourer who was employed to watch the fish-pond in the flower-garden at Bulstrode, about 50 years ago. The gold and silver fish had been missed, and the then

Duchess of Portland suspecting that the pond had been poached, ordered Mr. Agnew, the gardener, to employ men to watch. The watchmen detected the robbers, whom they saw alight on the side of the pond, and there waiting the approach of the fish captured and devoured them. The common brown Owls were the robbers. One of the men who reported the circumstance still attests the fact.

It must be a matter of astonishment to many persons, as well as to Mr. Bree, how the Owl could possibly contrive to capture fish, as it is impossible, from the formation of its head and the redundancy of feathers upon it, that it should emerse itself in water. It is well known that the Owl seizes its prey with its feet, and as the fish which Mr. Bree found under the young ones were bull-heads and loach, both of which are generally met with in shallow water, and were stated to be very abundant in a neighbouring brook, it would by no means be difficult for Owls to dart their talons into them as they pass. The sight of the Owl must be very acute, since it can capture mice in dark or dusky weather as it flies over a meadow. The same acuteness of vision would enable it to see fish in a shallow brook, and to secure them in the way mentioned.

> ' Dear is my little native vale,
> ' The Ring-dove builds and warbles there;
> ' Close by my cot she tells her tale,
> ' To every passing villager ·
> ' The *Squirrel* leaps from tree to tree,
> ' And shells his nuts at liberty.' ROGERS.

WHILE fishing in the beautiful grounds of Pain's Hill, near Cobham, I have had frequent opportunities of watching the habits of the Squirrels, which are there in great numbers. These engaging animals generally make their nests on the branch of a tree, appearing to give the preference to the fir. In forming the nest, they begin by gathering mouthfuls of dry benty grass, in the way we see rabbits do, and of this grass they make a considerable deposit. The outside is afterwards protected with a quantity of sticks, giving the nest or *drey*, as it is called with us very generally, the appearance of a bird's nest. When the young are ready to be deposited, the female Squirrel strips off her fur in the manner of the rabbit, so that its stomach is sometimes quite bare. This circumstance however enables the helpless young to find the teats more readily, thus answering a double purpose, affording them at the same time warmth, and removing the obstruction to their receiving nourishment. The Squirrel has from 4 to 5 young ones.

These, when very young, have an odd appearance, in consequence of the shortness of their tails, which are some time before they arrive at the full size. The young ones are easily reared, and soon learn to take milk out of a spoon, and become very tame and familiar. In a wild state the female shews considerable coyness, and when pursued by the male will drop from great heights from one branch to another. They make deposits of food, chiefly acorns, in holes of trees. I never, however, could hear of a drey having been found in such a situation, but generally on the branches, where I saw several about half way up the tree. I have, however, seen one on the very top of a young fir tree. Squirrels vary in colour, some having more white about them than others, and one was shot at Pain's Hill with a grey tail.

Squirrels are much delighted with the fruit of coniferous trees, such as the pine, the fir, the larch. They also feed on the birch, and probably the alder. As to Scotch firs, Squirrels not only devour the cones, but they also bark large boughs, and gnaw off the tops of the leading shoots, so that the trees are much injured and defaced by these little mischievous quadrupeds, which are too subtle and too minute to be easily taken or destroyed.*

I am not aware of there being two distinct breeds of Squirrels in this country; but in the park of Sir Thomas Winnington, in Worcestershire, and in that

* Since the above was written I have ascertained beyond a doubt that Squirrels will feed on small birds, which they have been seen to catch and devour.

of Sir R. Phillipps, in Pembrokeshire, several have been noticed with white or grey tails.

I have been able to collect very little information respecting Hedge-hogs. The keepers in Richmond Park assure me that they scratch out young rabbits from their nests, and eat them when they are only a few days old. They also feed on beetles, cock-chaffers, and worms. Hedge-hogs have from five to eight young ones at a litter, and the keepers frequently discover the nest by the outcry the young ones make when they are hungry. The dam, however, seldom quits them for any length of time.

The sagacity and foresight of Rats is very extraordinary, and the following anecdote, wonderful as it may appear, may be relied upon. I received it from a person of the strictest veracity, who was a witness of the fact. A box, containing some bottles of Florence oil, was placed in a store-room which was seldom opened, the lid of the box having been taken away. On going to the room for one of the bottles, the pieces of bladder and the cotton which were at the mouth of each bottle had disappeared, and a considerable quantity of the contents of the bottles had been consumed. This circumstance having excited surprise, a few bottles were filled with oil, and the mouth of them secured as before. The next morning the coverings of the bottles had been removed, and some of the oil was gone. On watching the room,

which was done through a small window, some rats were seen to get into the box and insert their tails into the necks of the bottles, and then withdrawing them they licked off the oil which adhered to them. I would not have ventured to introduce this anecdote had I not had every reason to be convinced of its accuracy.

A striking proof of the sagacity, courage, and I may say reasoning power of these animals, has been recently given me by a medical friend living at Kingston, who is much devoted to the pursuits of Natural History.

It appears that from his having entertained a great deal of surprise that the Ferret, an animal *of such slow locomotive powers*, should be so destructive and obnoxious to the rat tribe, he determined to bring both these animals fairly into the arena in order to judge of their respective powers; and having selected a fine specimen of a large and full grown male rat, as also an equally strong buck ferret, which had been accustomed to the haunts of rats, accompanied by his son, he turned these two animals loose in a room void of furniture, in which there was but one window, determined to await patiently the whole process of their encounter. Immediately upon being liberated, the rat ran round the room as if searching for an exit. Not finding any means of escape he uttered a piercing shriek, and, with the most prompt decision, took up his station directly under the light, thus gaining over his adversary (to use the language of pugilists) *the advantage of the sun*. The ferret

now erected his head, sniffed about, and seemed fearlessly to push his way towards the spot where the scent of his game was strongest, facing the light in full front, and preparing himself with avidity to seize upon his prey. No sooner, however, had he approached within two feet of his watchful foe, than the rat, again uttering a loud cry, rushed at him, and in a violent attack, inflicted a severe wound on the head or neck of the ferret, which soon discovered itself by the blood which flowed from it; the ferret seemed astonished at the charge, and retreated with evident discomfiture, while the rat, instead of following up the advantage he had gained, instantly withdrew to his former station under the window.

The ferret soon recovered the shock he had sustained, and erecting his head, once more took the field.

The second rencontre was in all its progress and results an exact repetition of the former, with this exception, that on the rush of the rat to the conflict the ferret appeared more collected, and evidently showed an inclination to get a firm hold of his enemy: the strength of the rat, however, was prodigiously great, and he again succeeded in not only avoiding the deadly embrace of the ferret, but also inflicted another severe wound on his neck and head. The rat again returned to his retreat under the window, and the ferret seemed less anxious to renew the conflict. These attacks were resumed at intervals for nearly two hours, generally ending in the failure

of the ferret, who was evidently fighting to a disadvantage from the light falling full on his eye whenever he approached the rat, who wisely kept his ground, and never for a moment lost sight of the advantage he had obtained.

In order to prove whether the choice of this position depended upon accident, my friend managed to dislodge the rat, and took his own station under the window; but the moment the ferret attempted to make his approach, the rat, evidently aware of the advantage he had lost, endeavoured to creep between my friend's legs, thus losing sight of his natural fear of man under the danger which awaited him from his more deadly foe.

The ferret by this time had learned a profitable lesson, and prepared to approach the rat in a more wily manner by creeping insidiously along the skirting, and thus avoiding the glare of light that heretofore had baffled his attempts.

The rat still pursued with the greatest energy his original mode of attack, namely, inflicting a wound and avoiding at the same time a close combat, whilst it was equally certain that his foe was intent upon laying hold of, and grasping, his intended victim in his murderous embrace.

The character of the fight, which had lasted more than three hours, was now evidently changed, and the rat appeared conscious that he had lost the advantage he originally possessed, and, like the Swedish hero, had taught his frequently beaten foe to beat himself in turn.

At last, in a lengthened struggle, the ferret succeeded in accomplishing his originally intended grapple; the rat, as if conscious of his certain ruin, made little further effort of resistance, but sending forth a plaintive shriek, surrendered himself to his persevering foe.

The progress of this experiment brought to proof the instinctive character of the animals engaged therein. There were many minor traits and circumstances illustrative of a reasoning power, the detail of which would far exceed the limits of this notice. It is evident, however, that in a state of nature, or in a fair field, the rat would probably be triumphant; but in close quarters, and particularly in the dark, the insidious ferret would ultimately prove the victor.

As regards the history of the Ferret, the same gentleman has also given me the following account of its sanguinary and ferocious character, showing its partiality for human blood had it the power more frequently to indulge its inclination. Some few years ago a poor woman, holding a mangled infant in her arms, rushed, screaming with agony and fright, into my friend's house, who is a surgeon, imploring him to save her child's life, who, she said, had been almost killed *by a ferret:* the face, neck, and arms were dreadfully lacerated, the jugular vein had been opened, as also the temporal artery; the eyes were greatly injured, and indeed the child, who is still living, has lost the entire sight of one of them, and has very imperfect vision in the other. Having

stopped the still bleeding vessels, my friend accompanied the mother to her cottage, on entering which, the child, in some degree recovering from its state of apparent death, began to cry, when the ferret was in an instant seen rushing from behind some bavins where he had taken shelter, and with his head erect, boldly came forward and met the infuriated parent in the middle of the room, still holding her infant in her arms. On my friend's kicking the ferret, as the first impulse of protection, the animal endeavoured to seize his leg, and not until his back was broken by repeated kicks did he give over his earnest and reiterated attempts to renew his sanguinary feast; and indeed, whilst in the agonies of death, the piteous screams of the child seemed to rouse him to vain efforts to regain his prey.

The ferret was of large growth, and much distended with the infant's blood; and although formerly of peculiar shyness, yet he lost sight of fear, and became ferocious in pursuit of the unfortunate infant. It appears the poor woman had left her child (about six months old), in a cradle whilst she went to market, when it is supposed the infant's cry, had arrested the attention of the ferret, who managed to make his escape, and thus effected his purpose. There is good reason to believe he must have past more than half an hour in the indulgence of his appetite, from the circumstances of the neighbours having heard the piercing shrieks of the child for a long time without the slightest suspicion of the mother's absence.

How now! a Rat? HAMLET.

DURING the very sudden rise of the Thames which took place this spring (1833), a great number of rats were observed on the willows which grow on the aits, or little islands of the river. Most of them, however, contrived to get to land, encountering the strong currents which then prevailed, and subsequently took refuge in drains, buildings, &c. In summer they appear to make their way from the aits to the shore every evening, getting up the drains, and entering houses, where they become a great nuisance to those who have residences on the banks of the river. In summer, rats haunt the fields, and especially corn-fields, where they make burrows and breed. They generally retire on the approach of the reapers, and get into the banks and hedges. They lay up a store of ears of corn, and I have seen a great quantity taken out of one of their runs. The damage therefore done by rats is not confined to the barn or corn-rick, but is much greater in the corn-field than is generally supposed. As they infest the fields in summer, I have no doubt but that they destroy a great quantity of game; and that much of the devastation which has been attributed to stoats and weazels, has been committed by rats. When these vermin abound much in a farm-yard during winter, but little game will be found in its immediate

neighbourhood in the ensuing autumn. Gentlemen, therefore, who are particular in the preservation of game, cannot pay too much attention to the cleanliness of the farm-yards of their tenants. It will be a great advantage to both parties. Mr. Broad's method of destroying rats never fails if properly attended to. His secret produced him 1000 guineas before he divulged it.*

The encrease of rats, where little pains are taken to destroy them, is something enormous. The females are supposed to breed five or six times a year, and they will produce 12, 14, 16, and even as many as 18 at a litter. The most interesting account of rats I have met with, was made some time ago in an official report to the French government. It was drawn up in consequence of a proposition made for the removal of the horse slaughter-house at Montfaucon, to a greater distance from Paris, when one of the chief obstacles urged against such a removal, was the fear entertained of the dangerous consequences that might result to the neighbourhood, from suddenly depriving these voracious vermin of their accustomed sustenance. The report goes on to state that the carcasses of the horses killed in the course of a day (and sometimes these amounted to 35) are found the next morning picked bare to the bone. Dussausois, a proprietor of one of the slaughter-houses, has, however, made a still more conclusive experiment. A part of his establishment is en-

* His traps, and instructions for using them, may be had at Lawrence's, late Osmond's, in Piccadilly East.

closed by solid walls, at the foot of which are several holes made for the ingress and egress of the rats. Into this enclosure he put the carcasses of two or three horses, and, towards the middle of the night, having first cautiously, and with as little noise as possible, stopped up all the holes, he got together several of his workmen, each having a torch in one hand, and a stick in the other. Having entered the yard, and closed the door behind them, they commenced a general massacre. It was not necessary to take any aim, for, no matter how the blow was directed, it was sure to immolate a rat, and those who endeavoured to escape by climbing up the walls were quickly knocked down. By a recurrence of this experiment, at intervals of a few days, he killed in the space of a month 16,050 rats. After one night's massacre, the dead amounted to 2,650, and the result of four hunts was 9,101. Even this can give but an imperfect idea of the number of these vermin, for the enclosure in which they were thus killed contains not above the twentieth part of the space over which the dead bodies of horses are spread, and which it is but fair to suppose must equally attract the rats upon all points. These animals have made burrows for themselves, like rabbits, in the adjoining fields, and hollowed out into catacombs all the surrounding eminences, and that to such an extent, that it is not unusual to see the latter crumble away at the base, and leave these subterraneous works exposed. So great is the number of these animals that they have not all been able to

lodge themselves in the immediate vicinity of the slaughter-houses, for paths may be distinctly traced leading across the fields, from the enclosures in which the horses are killed, to a burrow about 500 paces distant. These paths are particularly remarkable in wet weather, being covered with a clayey mud, which adheres to the feet of the rat on running out of the burrows.

The predilection these animals shew to one particular part of a horse is curious. They invariably begin by devouring the eyes, drinking the liquid contained in them, and eating the fat at the bottom of the orbit. There has not been one instance of a dead horse left one night exposed, the eyes of which were not devoured before morning.

During very severe frosts, when it becomes impossible to flay and cut up the bodies of horses that have been for any time exposed to the air, and when even the fragments of flesh lying about have become so hard as to render it difficult for the rats to feed upon them, they resort to the following expedient:—they penetrate into the body and there establish themselves, and devour the flesh, so that when the thaw comes, the workmen find nothing but a skin and a skeleton underneath, as clean and clear of flesh as if it had been prepared by the most skilful operator.

Their ferocity as well as their voracity surpass any thing that can be imagined, to prove which, the following fact was stated:—Mons. Magendie having gone himself to Montfaucon to procure twelve rats

upon which to make experiments, had them put together into a box. On his return home he opened the box and found but three rats, the others having been devoured by the survivors, and nothing remained of them but their tails and bones. The fact appears incredible, but the reporters declare that they had it from Mons. Magendie's lips.

The conclusion of the report is much too *important* to be omitted, and contains a useful hint to those who may be inclined to frequent the minor restorateurs of Paris. It goes on to say,—'a man and a 'woman are employed the whole year round in flaying and cutting up dogs and cats. The skins of the 'dogs are hung up to dry; those of the cats are 'carefully stuffed with straw; the fat of both is sedulously collected and melted down, and the paws 'sold to the glue makers. We never entered this 'establishment without finding a great number of 'dogs and cats flayed, embowelled, and trussed with 'the greatest care, and quite ready for the spit or 'stewing pan. As the heads and tails are always cut 'off, these cats and dogs thus prepared, present a very 'tempting appearance, and it would be somewhat 'difficult to distinguish them from animals of the 'same size which are admitted to our tables.'

It appears that dogs are trained to bring to land the dead dogs and cats floating in the Seine. The stench and filth at Montfaucon are stated to be of the most horrid description, and yet all the men, women, and children, were found to be in a very healthy state. Indeed during an epidemic disease which pre-

vailed in the neighbourhood, not one of the workmen of Montfaucon was attacked by it.

In an American work called 'Our Neighbourhood,' may be found some interesting facts respecting rats. It appears that they have been frequently known to gnaw through water-casks, it being a mistaken notion that rats will not make a hole through articles of this nature, or through the planks of a ship. It is probable that they only refrain from doing the latter, not because they have any sense of the danger in scuttling a vessel, but from their dislike to salt. The outside plank of a ship is nearly saturated with salt, the rats therefore gnaw until the taste of the wood becomes disagreeable to them, and then they desist.

Rats and mice seldom, if ever, infest a house at the same time. If the mice get possession first and are numerous, they can keep off a score or two of rats. If, however, they are small in numbers, the rats soon destroy them.

I find that rats devour the common brown shelled snail, great numbers of the latter having been taken from the interstices at the bottom of an old wall in my garden; while at the same time I found great quantities of the broken shells in a hole or run which some rats had made near the spot. Rats will also eat frogs, fish, and the bark of trees.

> 'Nature, enchanting Nature, in whose form
> 'And lineaments divine I trace a hand
> 'That errs not, and find raptures still renew'd,
> 'Is free to all men—universal prize.' COWPER.

In surveying the works of nature, in admiring their beauty, their order, their seasons, and the thousand attractions they possess, I sometimes think that the divine Author of our religion viewed them with corresponding feelings; and this reflection always affords me pleasure. He selected a garden, having a brook in it, as a place of frequent resort; and, in a beautiful passage, we find him telling us to 'consider 'the lilies of the field, how they grow—they toil 'not;' he adds, 'neither do they spin; and yet Solo- 'mon in all his glory was not arrayed like one of 'these.' He delightfully reminds us how securely we may trust to his care and love, by desiring us to 'behold the fowls of the air, which neither sow, nor 'reap, nor gather into barns; and yet our heavenly 'Father feedeth them.' Then, again, he tells us, 'that we are his sheep, and that He is our shepherd.' And at another time he illustrates his kindness and compassion by referring to the care and protection afforded by a hen to her chickens; and further assures us, that not even a sparrow falleth to the ground without the knowledge of our beneficent Creator. These, and other illustrations of our Sa-

viour's precepts, were taken from objects of nature, which probably immediately surrounded him, and may be admitted as a proof of the justice of the observation I have hazarded on the subject.

Throughout the whole of the New Testament the images taken from nature leave a stronger impression on the mind than almost any others. And sure I am that the close contemplation of those which assure us of the ever wakeful care and kindness of our Maker will bring with them a peaceful serenity of mind, which would be envied, if it could be justly appreciated, by persons who have hitherto thought but little on the subject.

I was occupied the other day, for a few moments in reflecting on the benefits accruing to mankind, from a remarkable instinct impressed by the great Creator on that insignificant grub the silk-worm? What warmth and comfort does it afford to us! How useful, convenient, and I may add, elegant, is the clothing we derive from it! But this is not all. Let us, for one moment consider how many thousands of persons are absolutely indebted to it for almost their very existence, in consequence of the employment it affords in nearly every country of the known world.

There is, however, another striking and interesting peculiarity attending the silk-worm, which I have not observed to have been hitherto noticed. It is the fact, that while the caterpillars of all the other tribes of moths and butterflies, when they have arrived at a certain state of maturity, show a restless disposition, and wander about and hide them selvesin

a variety of places in order to spin their cocoons, preparatory to their making their escape as moths, &c.; the caterpillar of the silk-worm, on the contrary, may almost be considered as a domestic insect, and is content to remain stationary in the open tray, or box, in which it may be placed. After consuming its immediate supply of mulberry leaves, it waits for a further quantity; and when the period is arrived for spinning its cocoon, instead of showing any migratory disposition, it seems to place itself with confidence under the care of man for the providing it with a suitable place for its convenience and protection. In the fly or moth state, the female is quite incapable of flight; and the male, although of a much lighter make, and more active, can fly but very imperfectly. This latter circumstance insures to us the eggs for the following season, thus completing the adaptation of the insect in its different stages to the purposes it is destined to fulfil for our advantage. To my mind this striking peculiarity in the habits of the silk-worm beautifully illustrates the care and kindness of the Almighty, in thus making an apparently insignificant reptile the means of conveying so many important benefits to man.

The migratory disposition of the common moths and butterflies is not, however, without its use, though we may not so immediately profit by it. I have before observed, that the caterpillars hide themselves in a variety of places. These, in the pupæ state, furnish food for our soft-billed birds during the winter, who search for and feed upon them. With-

out such a resource many of them must perish during a severe frost. Numerous insects also lay their eggs in living caterpillars, who die before they change into pupæ; so that the very existence, as it is well known, of some insects, is perpetuated by the destruction of others.

In noticing these facts, it seems impossible to withhold at least that silent admiration, which the ways of Providence in the works of the creation claim from every one, by whom they are properly contemplated. Trifling as the relation may appear to some persons, it ought to carry the conviction with it, that we are under the care and guidance of an all-wise and bountiful Creator. Happy shall we be if this instructive lesson is not lost upon us.

I do not know that I can do better than introduce here the following fact, which was communicated to me by an observant and veracious person. He informed me, that of all the natural phenomena on an extensive scale which, during a visit to America, arrested his attention, and excited his admiration of the ways of Providence, was the formation of Oyster banks on the sea-bord of Georgia. The land from the sea for about the space of from 12 to 18 miles is completely alluvial, and in general consists of uncultivated marsh lands, through which an iron rod might be thrust to the distance of 18 or 20 feet. A great number of large creeks and rivers are found meandering through these marshes, and owing to the sinuosities invariably resulting from running water, the bends of these rivers would, in a short time, cut

away the adjoining land to such an extent as would make the whole sea-board a quagmire. But it is a remarkable fact, that wherever the tide bends its force, its effects are counteracted by walls of living oysters, which grow upon each other from the beds of the rivers to the very verge of the banks. These fish are often found in bunches among the long grass growing upon the surface of the soil. They are in such abundance that a vessel of a hundred tons might load herself in three times her own length. These banks are the favourite resort of fish and birds, as well as of the racoon, and some other animals, who feed upon the oysters both by day and night. Bunches of them, sufficient to fill a bushel, are found matted, as it were, together; and the neighbouring inhabitants and labourers will light a fire upon the marsh grass, roll a bunch of oysters upon it, and then eat them. This barrier of oysters, like rocks of coral, must offer the strongest resistance to the force of the tide.

'Some to the holly-hedge
'Nestling repair, and to the thicket some;
'Some to the rude protection of the thorn
'Commit their feeble offspring: the cleft tree
'Offers its kind concealment to a few,
'Their food its insects, and its moss their nests.
'Others apart, far in the grassy dale,
'Or rough'ning waste, their humble texture weave.'

THOMSON.

There is not, perhaps, a more extraordinary proof of the affection and care which an all-wise Creator shews in the preservation of his creatures, than the extreme caution which he has implanted in some birds for the concealment of their nests. A little bird is impelled by instinct to prepare a place in which her eggs are to be deposited, and her future brood reared up. The task of fixing upon a proper situation seems to devolve upon the female. It has been so, at least, in several instances which have come under my own observation. Maternal anxiety is no doubt the cause of the caution used in concealing the nest. The ingenious contrivances which are used to escape observation, and the methods which are sometimes adopted to alter the appearance of the nest when it has been observed, are all, to my mind, convincing proofs of that beautiful and tender watchfulness which a kind Providence shews more especially to those little creatures which are most

feeble, and are therefore most in need of help. The eagle soars on high, and places her nest on a rock, and seems to bid defiance to the cruelty of man; but the little tender wren, feeble and unprotected as she appears, is endowed with faculties which are necessary for her own preservation, and prevent the extinction of the breed. This is one of the subjects which will always interest a lover of Nature, and furnish him with endless sources of contemplation.

Nature is said to pursue invariably the same course; and one would suppose that this was more particularly the case with respect to the nidification of birds, and that those species which were of a shy and retired disposition would show it on all occasions. There are, however, several proofs to the contrary; and I will mention one which has lately been communicated to me.

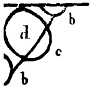
In one of the work-shops belonging to Mr. W. Cox's manufactory at Taunton, a water-wagtail built her nest. The room was occupied by braziers, and the noise produced by them was loud and incessant. The nest was built near the wheel of a lathe, which revolved within a foot of it. In this strange situation the bird hatched four young ones, and the male, not having accustomed himself to such company, instead of feeding the nestlings himself, as is usual, carried such food as he collected to a certain spot on the roof, where he left it, and from whence it was borne by his mate to the young. It is still more remarkable that she was particularly familiar with the men into whose shop she had intruded, and flew in

and out without fear. If, by chance, a stranger, or any of the other persons employed in the same factory, entered the room, she would, if in her nest, instantly quit it, or, if absent, would not return. The moment, however, that they were gone she resumed her familiarity.

The above account appeared in a provincial paper, and, in order to ascertain its accuracy, a gentleman called upon Mr. Cox, who assured him that it was perfectly correct. He took him to the shop and shewed him the nest in which the birds had been hatched, and it still remains in the same place. Mr. Cox also took him into a field, and shewed him the old bird with her four young ones, and so well did she know her old friends, that she allowed Mr. Cox to go close to her, although she would not let the visitor approach within twenty yards. It is difficult to account for the familiarity of so shy a bird, and for the departure from its general habits. The extraordinary sagacity also which enabled it to distinguish one human being from another is not a little remarkable. It affords another proof that we do not give sufficient credit to the inferior animals (as they are called) for intelligence, and I was going to add, for reflection. I will endeavour to prove this more fully by the following fact.

A swallow, in a gentleman's garden in Northumberland, adopted the following ingenious expedient to procure a foundation for her nest. The corner of the outhouse which she had fixed on for the purpose having no ledge or projecting stone to support the

superstructure, the little architect was observed to bring clay, with which she formed a ledge or bracket on each wall at a small distance from the corner. She then placed a piece of wood across, the ends resting on the brackets, and in this triangular nook she securely accomplished the object of her labours. The following sketch will explain more clearly the operations of the bird



a a represents a section of the wall.
b b the ledges or brackets.
c the piece of wood.
d the nest.

A gentleman, upon whose authority this anecdote is related, saw the progress of the nest, and always spoke of the contrivance of the swallow with extreme admiration.

The following is another instance of the ingenuity of birds in adopting expedients in building their nests to obviate inconvenience. A fauvette (Sylvia hortensis?) had twice built her nest in some ivy against a garden wall, and twice her labour had been fruitless, the nest having been blown down by some high winds. The third time, she prevented the recurrence of a similar accident by attaching a piece of worsted to a branch of the ivy, weaving it around the outer side of the nest, and carefully fastening the other end of the worsted thread to another conveniently situated branch.

I have now in my possession the pendent nest of

a golden-crested wren, which has been suspended to the slender branches of a fir-tree by means of threads. The threads have been curiously twisted round and round the branches, and then fastened to the edge or rim of the nest. By this means the nest is suspended, and vibrates backwards and forwards with the least touch.

In addition to these instances of ingenious contrivance, it would appear, from the following instance, that birds have an extraordinary faculty and foresight in avoiding danger, although it be not apparent at the time. Some years ago, a large and beautiful ash-tree was blown down in the vicarage garden of Newcastle-upon-Tyne. About one hundred and forty distinct rings marked the growth of this tree, and those circles which remained became too minute to be counted. The tree must, therefore, have been of great age. Upon examination it was found to be decayed near the root, a piece not above the thickness of a man's arm remaining sound at its heart. A colony of rooks had been in the habit of building their nests annually upon this tree; but it would appear as if they were aware of its approaching ruin, for about three years previous to its fall they deserted it for no apparent reason, and took up their abode in another ash-tree growing near, the situation of which was between the chimneys of the adjoining houses.

'As hungry wolves, with raging appetite,
'Scour through the fields, nor fear the stormy night;
'Their whelps at home expect the promised food,
'And long to temper their dry chops in blood'

DRYDEN'S VIRGIL.

HUBER, in his work on bees, mentions this curious fact, that when a Queen is required for a colony of those insects, a grub is selected, the cell which contains it is enlarged, and it is fed with a peculiar food. This food appears necessary to prepare it for that state, which it is requisite the future Queen of the colony should assume. This extraordinary foresight in insects, which leads them to prepare beforehand for the future benefit of the community, is not confined to bees. A gentleman whose name alone would be sufficient to attest the accuracy of the fact, communicated the following circumstance to me. He was travelling in Greece, and passed a few days at the house of an acquaintance in that country. While he was there, a large body of wolves came down from the mountains in the night, and committed great havoc on the sheep, goats, and other animals belonging to the inhabitants of an adjoining village. As the country people knew the place to which the wolves generally retreated, they assembled in a large body, and made an attack upon them. In the evening some of the peasants brought a dead wolf of a

large size to the gentleman referred to, and told him it was the leader or head of the pack of marauders. His foot was as large as the fist of a man. On questioning the country people, on the subject, they asserted, as a well known fact, that wolves were occasionally in the habit of selecting one particular whelp from a litter which they carefully concealed in some secure place, and fed with *live* animals. The wolf thus fed grew strong and vigorous, and subsequently became the leader or king of the pack, heading them on all occasions, and directing their operations.

It may be thought that there is not sufficient authority to prove the truth of this circumstance. It is not probable, however, that peasants would have invented the story, and in a country where wolves abound, there must have been many opportunities, through a succession of years, to enable them to ascertain the fact. The following curious and interesting passage, however, in the 19th Chapter of the Prophet Ezekiel, not only tends to confirm it, but almost to place its accuracy beyond a doubt. It is as follows ;—

'What is thy mother? a lioness: she lay down 'among lions, she nourished her whelps among young 'lions.

'*And she brought up one of her whelps;* it became 'a young lion, and it learned to catch the prey.

'The nations heard of him, he was taken in their 'pit.

'Now when she saw that she had waited, and her

hope was lost, *then she took another of her whelps, and made him a young lion.*

'And he went up and down among the lions, he became a young lion, and learned to catch the prey.'

There is no doubt that these words are prophetical, but we know that in the Bible, allusions are constantly made to the habits of animals, and which are so accurately descriptive of them, that we can have no doubt of their being taken from actual observation. In the instance before us, the Prophet Ezekiel seemed to be aware of the circumstance which has been related, and appears to have made use of it to illustrate the condition of the princes of Israel.

Few things are more interesting than tracing the truth and accuracy of the Holy Scriptures, by comparing what is said of the customs and habits of Eastern nations, with what antient and modern travellers have related of them. For instance, in the 9th Chapter of the Prophet Ezekiel it is said that 'a 'man amongst them was clothed with linen, with a 'writer's ink-horn by his side,' or upon his loins. It is well known to those who have travelled in Eastern countries, that even at the present time persons employed to write, carry an ink-horn tucked into their girdle on one side of them, and pens or reeds on the other. The Psalmist speaks of the 'dew of Hermon,' a hill near Nazareth. Maundrell says, 'we were sufficiently instructed by experience, what the holy 'Psalmist meant by the dew of Hermon, our tents 'being as wet with it as if it had rained all night.'

In the 49th Chapter of the Prophet Jeremiah are these words:—'He shall come up like a lion from 'the swelling of Jordan.' The banks of this river are still covered with a thick underwood of shrubs, in which several sort of wild beasts harbour themselves. During the periodical overflowings of the river, these beasts are driven out of the covert, and this circumstance gave occasion to the comparison referred to.

These, and instances without end, might be brought forward as satisfactory proofs of the accuracy of biblical allusions, and which are as authentic as they are interesting.

I cannot quit the subject which gave rise to these remarks, without mentioning that probably all gregarious animals have some particular leader to direct their movements. This is the case with wild cattle and deer, and also with wild geese. It is difficult to conjecture how this leader is appointed, or under what influence his companions are induced to follow his movements. That they do so, however, is placed beyond a doubt.

'Listen to Nature,
'A thousand joys her happy followers prove,
'Health, plenty, rest, society, and love.'

LORD HERVEY.

THERE are few people who do not enjoy a walk on a fine, smiling day in June, along meadows through which a stream of water takes its restless and meandering course. For my own part, in such a spot I always find something to interest and amuse me, and especially at the period when the grass is just ready for the scythe. Even the rustic bridge, which enables me to quit the sweets of a bean-field for the less powerful, but more delicate perfumes of my favourite meadows, is not without its interest. The trunk of an old willow pollard thrown across the little streamlet forms the bridge, and on one side, an equally rude rail has been nailed between two small alders to assist the helpless in making good their passage. Sedges and meadow-sweet, and here and there a bunch of brambles, mixed with honeysuckles, may be seen along the sides of the clear and silent stream. On approaching them a rat takes fright, jumps into the water, and rapidly makes his way to the opposite bank. At the same time perhaps a water-hen takes the alarm, and may be observed stealing along the sides of the stream, some-

times hidden by the sedges, and then appearing in view again, giving a sort of jerk with her beak and white tail, and occasionally uttering a plaintive call to induce her little black brood to follow her.

As I pursue my walk along the foot-path, the pretty tufted Vetch (Vicia Cracca), the Cammock (Ononis Spinosa), the great Burnet (Sanguisorba Officinalis), the Cuckoo-flower (Cardamine Pratensis), and various other plants attract my attention. I disturb a titling or meadow pipit (Anthus Pratensis), and it settles at a little distance on the stalk of a wild sorrel plant, quivering with its wings, and then rising again slowly, it hovers in the air for an instant, and warbles sweetly till it alights on the ground. The sky-lark sings his song of love over my head, till after straining my eyes for some time, I discover a small speck amidst the blue liquid sky. This is my favourite bird. Far distant as he is from me, every note may be heard, owing to the calmness of the day:

> 'How splendid all the sky! how still!
> 'How mild the dying gale!
> 'How soft the whispers of the rill
> 'That winds along the dale!
> 'So tranquil Nature's works appear,
> 'It seems the Sabbath of the year.'

Butterflies of various sorts may be seen in every direction, sometimes settling on the flowers, and at others sporting together in the most joyous manner; while grasshoppers and numerous other insects pro-

duce a sort of harmony which cannot be unpleasing. Such is a meadow *scene* on a fine summer's day.

In pursuing my walk, I come to a small copse of old oak trees with an underwood of hazels, and a few hollies interspersed here and there. Earlier in the year the ground is covered with a profusion of blue-bells and primroses. They have now disappeared, but the tangled honey-suckles, the dog-roses, and various other flowers, give a cheerfulness to the spot, and here too I can enjoy the coolness of the shade. The stream has taken a sudden bend, and runs close under the copse. Insects play between the water and the overhanging branches of an oak-tree, while a thrush sings his melodious notes on its topmost bough;—

> · the thrush-haunted copse
> ' Where the brisk squirrel sports from bough to bough;
> ' While from an hollow oak, whose naked roots
> ' O'erhang a pensive rill, the busy bees
> ' Hum drowsy lullabies.'

In my walk through the copse, I on one occasion disturbed a wren, and soon afterwards found its nest by the side of the stump of an old thorn tree. I like to see the bustle and activity of these minute birds during the time they have young ones. They then shew great anxiety, and appear in a bush or along a hedge more like mice than birds. A gentleman, who, like myself, is fond of observing the habits of birds, on visiting one day a cottage in his neighbourhood, was told by some children of a wren's

nest in a low hedge near the cottage. Wishing to have it left unmolested, he promised the children that if they would take care of it he would give them a reward. On visiting the nest a short time afterwards, he found that the usual hole of the nest had been stopped up, and immediately accused the children of having broken their promise not to touch the nest. They protested that they had never once meddled with it, or disturbed the old bird, but acknowledged that they had frequently looked at it. On examining the nest more attentively, it was found that the original hole of entrance to it had been stopped up, and that another had been made at the back part. It was evident that the bird, disliking to be looked at, and feeling unwilling to forsake her eggs, had taken this method of obviating the inconvenience to which she was subjected. This little anecdote affords another proof of the sagacity and foresigh of animals.

The Water-crake (Rallus Aquaticus), is sometimes found in the meadows I have been referring to. It is, however, a scarce bird with us, and is exceedingly shy and solitary. It is said to form a buoyant nest, which rises and falls with the water, and is moored to the stalk of a reed or bull-rush. It shews great ingenuity and perseverance in avoiding dogs, running and skulking among high grass and rushes, so that it is difficult to get it on the wing. The young ones, both of this bird and the water-hen, do not appear to require the care of the mother for any length of time, as they soon leave her.

It was on my return from a walk in these meadows that I had an opportunity of observing the almost total loss of the power of self-preservation in a rabbit, which was pursued by two weazels. It appeared to lose that activity and cunning which I have so often observed in it when pursued by dogs. It will then steal from break to break, stand on its hind legs, listening to every sound, and will, when necessary, creep into a hole. In the present instance, however, all its faculties appeared to be paralyzed while the weazles were in pursuit. It bounded about in a sort of circle, shrieking with terror, and seemingly incapable of getting away from its enemies, who would soon have destroyed it had it not been for my interference. Its hole is always avoided by a rabbit when pursued by weazles. I have been assured that weazles have been known to hunt hares and rabbits in small packs, and have myself had opportunities of observing that they hunt by the scent.

It has always struck me as a curious fact, that during my walks I have but very rarely met with a dead bird. When we consider the countless myriads of birds of various kinds, and how few of them, comparatively speaking, are killed by man, or taken alive, it becomes a matter of curious enquiry what becomes of the vast remainder. It may be thought that when disease or old age overtakes them, they get into holes and hedges and die. But whoever found any in such places? Or it may be said that vermin devour great numbers, and that

many destroy each other; but how seldom is the skeleton or the remnant feathers of a dead bird seen compared with the multitudes whose existence is not ended untimely. I should be grateful to any one who would at all lessen my curiosity, by throwing any light on the subject.

'Through lofty groves the ring dove roves,
'The path of man to shun it;
'The hazel-bush o'erhangs the thrush;
'The spreading thorn the linnet.
'Thus every kind their pleasure find,
'The savage and the tender;
'Some social join, and leagues combine,
'Some solitary wander.' BURNS

It is curious to witness the assistance which some animals will afford to each other under circumstances of danger or of difficulty. I have observed it in several instances, and it shews a kindness of disposition which may well be imitated. It is not, however, confined to their own species, as the following fact will prove. A farmer's boy had fed and taken great care of a colt. He was working one day in a field and was attacked by a bull. The boy ran to a ditch and got into it just as the bull came up to him. The animal endeavoured to gore him, and would probably have succeeded had not the colt come to his assistance. He not only kicked at the bull, but made so loud a scream, for it could be called nothing else, that some labourers, who were working near the place, came to see what was the matter, and extricated the boy from the danger he was in. I have seen cattle, when flies have been troublesome, stand side by side, and close together, the head of one at

the tail of the other. By this mutual arrangement flies were brushed off from the head of each animal as well as their sides, and only two sides were exposed to the attacks of the insects. Sheep have been known to take care of a lamb when the dam has been rendered incapable of assisting it, and birds will feed the helpless young of others.

Birds also will cluster together for the purpose of keeping each other warm. I have observed swallows clustering, like bees when they have swarmed, in cold autumnal weather, hanging one upon another, with their wings extended, under the eaves of a house. I have also heard more than one instance of wrens being found huddled together in some snug retreat for the purpose of reciprocating warmth and comfort. The following interesting communication on this subject was made to me by Mr. Allan Cunningham, an author of whom his countrymen are justly proud, and who, I trust, will long continue to delight his admirers with the productions of his pen.

He says, 'I have once or twice in my life had an 'opportunity of answering that touching enquiry of 'Burns—

> 'Ilk happing bird, wee, hapless thing,
> 'That in the merry months o' spring,
> 'Delighted me to hear thee sing,
> 'What comes o' thee?
> 'Whare wilt thou cower thy chitt'ring wing
> 'An' close thy e'e?'

'One cold December night, with snow in the air, 'when I was some ten years old or so, I was groping

'for sparrows under the eaves in the thatch, where 'you know they make holes like those bored by 'swallows in the river-banks. In one of these holes 'I got a handful of something soft; it felt feathery 'and warm, and a smothered chirp told me it was 'living. I brought it, wondering, to my father's 'house, and took a look at it in the light. The ball 'consisted of four living wrens * rolled together, the 'heads under their wings, and their feet pulled in, 'so that nothing was visible outside save a coating of 'mottled feathers. This I took to be their mode of 'of keeping themselves warm during the cold of win-'ter. If you ask if I am sure my memory serves me 'rightly, I answer yes; for having allowed one of 'the wrens to escape, it flew directly to where my 'father was reading at a candle, and I had the misery 'of receiving from his hand one of those whippings 'which a boy is not likely soon to forget.

'When eighteen years old, or thereabouts, I met 'with something of the same kind: there was a dif-'ference, indeed, in the birds, for on this occasion 'they were magpies †—not birds of song, but of 'noise. I went out with my brother, now in the 'navy, one fine moonlight winter night, to shoot 'wood-pigeons in a neighbouring plantation. The 'wind was high, and we expected to find them in a 'sheltered place, where the soil was deep, and the

* The Scotch call them *cutie*-wrens, on account of their short tails.

† Magpies are called by the Highlanders 'Plack and Plue 'Purds,' on account of their colour.

spruce firs had grown high. As I went cowering along, looking through the branches between me and the moon, I saw, what seemed as large as a well filled knapsack, fixed on the top of a long, slender ash-tree, which had struggled up in spite of the firs, which you know grow very rapidly. I pointed it out to my brother, and seizing the shaft of the tree, shook it violently, when, if one magpie fell to the ground, there were not less than twenty dropt in a lump at my feet. Away they flew screaming in all directions. One only remained on the spot which they occupied on the tree, and I shot it, and so settled what kind of birds had been huddled together to avoid the cold. I looked at them before I shook them down for a minute's space or more, and could see neither heads nor feet; it seemed a bundle of old clouts or feathers.'

'The insect-youth are on the wing
'Eager to taste the honied spring,
'And float amid the liquid noon;
'Some lightly o'er the current skim,
'Some shew their gaily-gilded trim
'Quick-glancing to the sun.' GRAY.

I HAVE had some curious and interesting specimens of wasps' nests sent to me during the present winter, (1832) and also a hornet's nest, taken from the roof of one of the buildings at the stud-house in Hampton Court park. The latter was of a large size, and the combs were covered with a profusion of a substance in large flakes, resembling light brown paper. Some of these flakes were eighteen inches in length. When it is considered that one single female hornet is the founder and parent of a new colony, and that by her own unassisted exertions she forms the first cells for her brood, and covers them with a sort of umbrella to shelter and keep the grubs warm, we may form some idea of the prolific powers of the insect In one season, sufficient materials were collected to fill a bushel by the united exertions of herself and progeny, all of them most beautifully arranged, and worked up chiefly, I believe, from decayed wood. All this is, however, forsaken as winter approaches. The males and neuters perish, and the several females retire to their respective hiding places till the spring

approaches, and then begin their labours of founding fresh colonies.

The most curious and beautiful insect's nest, however, which I have seen in this country was found, under the slates of a new building a few days ago (February 25th, 1833) at Hampton Court. It was a wasp's nest, and must have been made in the course of the last summer, the roof of the building having been uncovered the preceding spring. Nothing can exceed the extraordinary workmanship of this very interesting specimen of an insect's labour, and I only regret that I cannot give the reader an adequate idea of it. The nest itself is in the Zoological Museum, to which Society I presented it. It is nearly six feet in circumference. The hole of entrance has been made almost as hard as a piece of wood: had it not been so, the entrance and exit of so many insects would have worn it away. Wasps, I believe, form their nests from the raspings of green wood. The external covering of the one in question resembles, very much, a mass of very small oyster-shells.

There is one very remarkable circumstance with regard to hornets, wasps and bees, which I must not omit to notice, and which affords another proof of the bounty and kindness of Providence. We know how frequently honey is noticed in the Scriptures: it is mentioned not only as the food of man, but as a blessing bestowed upon him. 'A land flowing with 'milk and honey.' 'Butter and honey shall every 'man eat.' 'With honey out of a rock will I satisfy 'thee.' These and many similar expressions in the

Bible shew that honey was considered by Almighty God as a blessing bestowed upon mankind. And with what an extraordinary instinct and sagacity has he endowed the little insects which collect it for our use! The whole of their economy is, indeed, wonderful. Like the silkworm, which, different from all the other caterpillars of the moth and butterfly tribe, shews no migratory disposition, but is a sort of domestic insect, the female bee, when she leaves her hive with a new colony, settles on a neighbouring bush, allow herself to be hived, and thus insures her ultimate utility. Her progeny survive the coldest winters, and on the return of spring, quit their hives, and joyfully and unremittingly resume their labours. Dr. Paley has noticed this circumstance. He says tha 'a bee amongst the flowers in spring is one of the 'cheerfullest objects that can be looked upon. Its 'life appears to be all enjoyment: so busy, and yet 'so pleased.' Thus its honey is stored up, and in a good season, in such quantities, that a third, and frequently a half, may be taken from them, leaving a sufficient quantity for them to subsist upon during the ensuing winter. Such, however, is the cruelty and rapacity of man, that, not content with a part of the treasure of the hive, he must have the whole, and in order to obtain this he destroys 20,000 or 30,000 of these industrious insects.

How different is the case with respect to hornets and wasps! When winter approaches, having no stock of provisions for their young, the old wasps destroy those which are in the cells, and others be-

come benumbed with the cold, and perish. If a wasp's nest is examined in the month of November, not one wasp will be found alive in it. The female or queen wasps, only, retire to some winter retreat in an old tree or wall, and in the spring become the founders of a new colony. This is also the case with hornets. If the whole colony survived the winter, they would increase to a frightful degree, and be a prodigious annoyance to mankind. It is impossible not to admire this beautiful provision of Nature. The bee is useful to us, affording food with its honey, and light and other beneficial purposes with its wax, and therefore multiplies, if properly attended to, in a surprizing manner. Wasps and hornets, on the contrary, are kept within due bounds: they multiply in the summer, when flies and other insects on which they feed are most abundant, keeping down too great an increase of these, and perish in the winter, when they are no longer wanted. The circumstance which I have mentioned of their destroying those helpless young which they had previously tended with the utmost affection, may at first sight appear a cruelty; but it is the contrary. When the cold weather sets in, there is no food for them: instead, therefore, of undergoing all the pains of hunger, and a lingering death, the old wasps are possessed with an instinct which makes them destroy the helpless brood. Mr. Kerby has well remarked, that this apparent ferocity is the last effort of tender affection, active even to the end of life: and that they may suffer as little as possible, the Creator, mindful of the happiness of

the smallest of his creatures, has endowed a part of the society, at the destined time, with the wonderful instinct which, previously to their own death, makes them the executioners of the rest.

Those who have paid attention to their bees will probably have observed the following occurrence, which is by no means unusual. Although it is not favourable to the honesty of these insects, it proves their great foresight, and their unwillingness to form a fresh habitation when they can procure one ready prepared for them.

In a cottager's garden at Haydon bridge, a village on the South Tyne, in Northumberland, was a hive of bees, rather few in number. For several weeks before the swarming season, stranger bees were observed to come and engage in fierce contests with the inhabitants of this hive, always leaving some dead upon the ground; and thus day by day their weakness became more apparent. About a mile distant from the cottage, on the other side of the river, a swarm of bees left a hive, took a direct course down the hill and across the river, and engaged in a final battle with the weaker colony; they soon conquered, and took possession of the hive.

This anecdote tends to confirm an observation I have frequently made, that long before a fresh colony is to be formed, several bees are actively employed to prepare a place to which the future queen is to be conducted. I have followed them to a considerable distance, and the swarm has been led in a direct line to a hollow tree, or to the roof of some building:

this could not have been the case if the situation had not been previously fixed upon. The instinctive knowledge which leads an insect to prepare a place to which a queen bee, not yet, perhaps, arrived at perfection, is to be conducted, and the faculty it possesses of making her aware that such a place has been selected, is not amongst the least curious circumstances in the economy of Nature.

It is difficult to ascertain the period of the life of bees, or indeed of any insects. Spiders, however, are certainly long-lived. I have known one which inhabited the same place for a great length of time. A lady, however, to whom I am indebted for several interesting facts in natural history, states, that two spiders have been in the occupation of two webs on opposite sides of a large drawer for thirteen years. This drawer has, in that period of time, been used exclusively as a repository for soap and candles, and has been kept always closed and locked, except when opened to put in or take out these articles. The spiders are constantly in the same attitude in a hole in the inner corner of their webs, and seldom shew more of their bodies than the two forelegs projecting outwards towards their nets. This is the only satisfactory fact I have met with respecting the age of an insect.

I have mentioned elsewhere an instance of the longevity of a tortoise. The following anecdote on this subject will, I am sure, be read with interest.

In the summer of the year 1825, a gentleman (now in England) was resident on an estate in New

Jersey, North America, which had been originally purchased, and personally surveyed, by his maternal great great-grandfather in the year 1708, as appeared by reference to the title-deeds. On a hill-side, still clothed with the native forest, whence the survey was originally begun, was found, and brought to him by his labourers, a small land tortoise, of about four pounds weight, with the letters D. W. C. (the initials of his ancestor), and the date of 1708 engraved upon the lower shell. The inscription was perfectly legible, and appeared even fresh, though the lines were somewhat widened or exfoliated. To carve their names in this manner on the tortoises is a very common practice among the idlers of America, as to 'mar the trees' with their mistresses' names, has been customary (at least since Shakspeare's days) by those idlers, *par excellence*, the true lovers of England. Now it can be nearly proved that on, or about the spot, where this patriarchal tortoise was discovered, Mr. D. W. C. must have passed several idle and solitary hours. It is the custom in surveying, first to go round the land, and after arriving at the point of original departure, to send the surveyors back upon their footsteps for the purpose of verifying the courses and distances which they had first noted. The principal person seldom takes the trouble of accompanying his people on this second perambulation. From these circumstances, connected also with the improbability that any other person, at any other time, should have fortuitously hit upon the same combination of letters and date, it is morally

certain that the little tortoise was in existence one hundred and fifteen years at least before he came into possession of the person who has now given us his history. In what past age his birth occurred cannot now be known: but from the promise of his past career, he may probably live to be the subject of another memoir in some succeeding century.

'each moss,
'Each shell, each crawling insect, holds a rank
'Important in the plan of Him, who fram'd
'This scale of beings; holds a rank, which lost
'Would break the chain, and leave behind a gap
'Which nature's self would rue' THOMSON.

There is no study perhaps more delightful than that of tracing the all wise disposition of the Creator in the reciprocal uses to which all created things were designed. It is impossible to contemplate this subject without being struck with the infinite wisdom of Almighty God. We find things so connected together, that they are all subservient to the same end, and all contribute to assist in the preservation of the several species. The death and destruction therefore of one thing, is made useful in the restitution of another, and this is one of the most interesting facts in the economy of Nature. Every thing is so perfectly contrived, so wonderfully propagated, and so providentially supported, that we are not only lost in wonder when we reflect upon them, but are obliged to confess that after all the researches and observations which have been made, an ample field still remains for fresh remarks and interesting discoveries in the works of Nature.

-'Almighty Being,
'Cause and support of all things, can I view,
'These objects of my wonder, can I feel
'These fine sensations, and not think of thee?"

It would afford me a satisfaction which I cannot describe, could I think that these reflections, feebly as they are expressed, would lead any one to acknowledge the power and goodness of the Creator, as seen in the works of his creation and to improve his mind by the study of them. In every plant, in every insect, we may observe some beauty or some curious properties which are not to be found in other bodies. On comparing them we shall be convinced that they were not created by chance, but were contrived for some useful purpose.

Few things are more interesting than seeing the method which nature takes in the preservation and well being of her creatures. I am assured that when a sheep has two lambs at a time, she will not permit one to suck her unless the other is present. But for this instinctive arrangement, one of her offspring would have an undue proportion of nourishment, and the other would either starve or degenerate.

It is well known that a pigeon usually lays but two eggs. If, however, a third is laid, which is sometimes the case, it has never I believe been known to come to maturity. If three young pigeons were to be fed, none of them would probably be vigorous, and the race would degenerate. This is another instance of the interest which Nature takes in the well being of her creatures. The cow affords a similar instance, if she has twins; one of them a male, and the other a female, the latter is always barren.

If a doe produce a white fawn, with red eyes, its under jaw is always defective, and it is starved to death. A wise provision of Nature, in preventing what would probably be feeble from arriving at maturity.

When we consider also the way in which the Creator has provided for the clothing of animals, according to the climates of the places in which they are found, we shall have no less cause to admire his goodness. In hot countries many animals have but little hair on their bodies, and some are almost entirely without it, such as elephants, monkies, &c. In very cold countries, the fur as well as the hair of animals is very thick, and even the feet of some birds are covered with feathers, not only to protect them, but to enable them more readily to run upon the snow. Animals also, which have been brought from one country and domesticated in a different and opposite climate, are not neglected by nature, but are provided with such a change of covering as is best suited to it. How different is the covering of a Shetland pony to that of an Arabian or Persian horse, one has to endure the extreme of cold, and the other of heat, and we see how kindly Nature has provided for both.

Ducks which lay early in the year strip more of their feathers off, and make their nest much warmer than those which lay later in the season. This instinctive property is very curious, and shews the foresight which has been implanted in animals.

It is well known that in hot countries, where the

blood of horses is heated by the climate, they are in the constant habit of bleeding each other, and sometimes of bleeding themselves. This is done by biting the neck or the shoulder. These, and a great variety of other interesting facts in the economy of Nature, prove that animals are in possession of faculties, beyond mere instinct, and which they use to their own advantage under peculiar circumstances. Thus, a friend of mine saw a fine greyhound, which had been incessantly teased by a small spaniel, take it up into his mouth and drop it over the parapet of a terrace into a river which flowed below it. The noble animal was unwilling to hurt his tormentor, and therefore took this opportunity of freeing himself from its annoyance. The dog in this instance did what instinct alone would not have taught him to do, and afforded another proof of the truth of the remark I have made above.

I will give another instance of this :—A horse and a cat were great friends, and the latter generally slept in the manger. When the horse was going to have his oats, he always took up the cat gently by the skin of her neck, and dropped her into the next stall, that she might not be in his way while he was feeding. At all other times he seemed pleased to have her near him.

I might produce more examples of this kind, but enough has been said to draw some attention perhaps to this most interesting subject. We may certainly improve our minds by the study of this and other curious facts in Natural History, and there can, I

think, be no doubt but that the Great Creator intended we should study them. From the admiration of his works, we shall be led to extol his glory :—

'By swift degrees the love of Nature works,
'And warms the bosom; till at last sublim'd
'To rapture, and enthusiastic heat,
'We feel the present Deity, and taste
'The joy of God to see a happy world!'

'O Nature! a' thy shews an' forms
'To feeling, pensive hearts ha'e charms!
'Whether the summer kindly warms
'Wi' life an' light
'Or winter howls, in gusty storms,
'The lang, dark night!' BURNS.

PRINCE Lucien Buonaparte observes, in his American Ornithology, that the pugnacious disposition in the males of some animals is not to be regarded as accidental, but as resulting from a wise and excellent law of nature, which always studies the good of the species without regard to the individuals. Did not females prefer those males which are victorious, feebleness and degeneracy would soon mark the animal creation; but, in consequence of this general rule, the various races of animals are kept up by those individuals who are not only most to be admired for their external appearance, but most to be valued for their intrinsic spirit and energy. We see this amongst herds of deer, as well as in our poultry-yards, and in various other instances. It affords another proof, amongst numerous others, of that wise and beautiful order in Nature by which every thing is preserved and kept up in the most perfect manner.

The intellect, if I may call it so, with which ani-

mals are endowed, and which they exercise under peculiar circumstances, is also worthy of observation. M. Audubon, in speaking of the wild turkey of America, mentions an instance of their intelligence. He says, that having discovered a sitting hen, he remarked that by assuming a careless air, whistling or talking to himself, he was permitted to pass within five or six feet of her, but, if he advanced cautiously, she would not suffer him to come within twenty paces, but ran off twenty or thirty yards with her tail expanded, when, assuming a stately gait, she paused at every step, occasionally uttering a *chuck*. I observed nearly a similar instance in the case of a thrush which built her nest close to my garden-gate. If I did not stop to look at her when she was sitting, she never quitted the nest, but if I stood and fixed my eye upon her, she left it, and on one occasion on my remaining longer than usual she entirely forsook it. I may stand for a long time close to a rabbit in its form without its quitting it, but I have frequently observed that the moment our eyes have met, it has run away. Animals must, therefore, be possessed of some extraordinary instinct which makes them aware that they are seen As long as they have a consciousness that they have not been discovered, however near we may approach them, they remain either in real or fancied security. This I have frequently observed to be the case with the nightingale. It will sing when I am close to it, but while it gives utterance to its beautiful notes it generally selects

a thick and almost impervious bush for its retreat;

> 'the Nightingale
> 'In shadiest covert hid.'

The moment, however, my eye rests upon it, its song ceases.

Birds, and indeed most animals, shew an extreme jealousy in the care of their young, removing them when discovered to places of greater safety, and are often forgetful of their own preservation when that of their offspring is in danger. I have no hesitation, however, in giving the palm of parental affection to birds in preference to quadrupeds. The latter, and all the class of mammalia, are reminded of their young, when their milk becomes inconvenient, and this circumstance is another of the benevolent provisions of Nature for the helpless young. Birds, however, have no such motive, and yet how unceasingly are they occupied in providing for their brood, and how cheerfully do they appear to perform their offices of love and affection. From morning to night they are occupied in feeding them, and whatever their own wants may be, they are neglected till those of their young are satisfied. A hen eats but little during the period of incubation, and nothing during the last two days she is occupied in hatching her brood. When, however, she quits her nest with it, her first care is for her chickens, and hungry as she must be, she eats nothing until they have been fed. Magpies, the most vigilant of birds for their

own safety at other times, are extremely bold when their young are to be fed, or when their safety is endangered. It is a common practice amongst gamekeepers, when they want to destroy the old birds, to take the young out of a nest, and make them squeak. The parents on hearing the well known cry of distress, hasten to the rescue of their young, and are then shot. This is the case with jays and other birds of prey, who thus frequently fall the victims of their parental affection. In the case of birds also, this affection is in most cases partaken of by both parents. In that of mammalia it is generally confined to the female, who, besides the care of nourishing her offspring, has in some instances, to protect them from the ferocity of the male.

I think I have mentioned enough to shew how strongly the love of their offspring is implanted in animals. It is not confined, however, to their young alone, for I see more and more reason every day to admire the delightful manner in which many animals shew their love and affection for each other, as well as for their young. I have seen a sheep which was brought up by hand, and which had only a solitary horse to bestow its affections upon, quietly grazing near its ea'ly friend, forsaking those of its own species. I likewise remember a cat and a dog which were great friends. If the dog was made to howl, the cat immediately flew to his rescue, and shewed much anger. Pigs evince much sympathy for one of their own species when in distress.

'A parent-bird, in plaintive mood,
'On yonder fruit-tree sung,
'And still the pendant nest she view'd
'That held her callow young:
'Dear to the mother's fluttering heart
'The genial brood must be.' CUNNINGHAM.

AN interesting subject for observation in natural history, is the mode adopted by different animals and insects in feeding their young in the early stage of their existence. The instinct implanted by a beneficent Creator in the parent animals, by which they are in the first instance taught to nourish their young with such food only as is congenial with their weak and infant state, affords, to my mind, another proof of the care and kindness bestowed by a merciful Providence on all His creatures. Every observer and every lover of Nature must have seen this in a variety of cases. The hen pheasant leads her newly hatched brood into grass fields, in the first instance, in search of ant-hills, and as they grow stronger, and are able to digest the food, into corn fields. Many birds feed their young during the first few days of their existence with small grubs and insects, and with large worms as they grow older, varying the food according to their growth. Some insects deposit their eggs in a substance which first serves to protect and bring them to maturity, and afterwards as

food for the maggot when the embryo arrives at that state. We are indebted to Mr. John Hunter for a curious and interesting account of the manner in which the dove kind feed their young. He says that during incubation, the coats of the crop in the pigeon, are gradually enlarged and thickened, similar to what happens to the udder of females of the class mammalia. On comparing the state of the crop when the bird is not sitting, with its appearance during incubation, the difference is very remarkable. In the first case it is thin and membraneous; but by the time the young are about to be hatched, the whole, except what lies on the trachea, becomes thicker and takes on a glandular appearance, having its external surface very irregular. It is likewise evidently more vascular than in its former state, that it may convey a quantity of blood, sufficient for the secretion of the substance which is to nourish the young brood for some days after they are hatched.

Whatever may be the consistence of this substance, when first secreted, it very probably soon coagulates into a granulated white curd, for in such a form it is always found in the crop; and if an old pigeon is killed just as the young ones are hatching, the crop will be found as above described, and in its cavity pieces of white curd mixed with some of the common food of the pigeon, such as barley, beans, &c. If we allow either of the parents to feed the brood, the crop of the young pigeons, when examined, will be discovered to contain the same kind of curdled substance as that of the old ones, which

passes from thence into the stomach, where it is to be digested.

The young pigeon is fed for a little time with this substance only, as about the third day some of the common food is found mingled with it. As the pigeon grows older, the proportion of common food is increased, so that by the time it is seven, eight, or nine days old, the secretion of the curd ceases in the old ones, and of course no more will be found in the crop of the young. It is a curious fact, that the parent pigeon has at first a power to throw up this, and without any mixture of common food, although afterwards both are thrown up according to the proportion required for the young ones.

A curious instance was recently communicated to me of the method taken by a bitch to feed her young puppies. An acquaintance of mine has a beagle, which lately had a litter of whelps. When they were a few weeks old, she had not sufficient milk to support them. In order, therefore, to feed them, she was in the habit, two or three times a day, of throwing up the contents of her stomach close to her puppies, on which they fed. The food ejected from her stomach always appeared in a nearly digested state: had it been otherwise, the whelps could not have fed upon it. Lord B. also has a poodle bitch which invariably empties the contents of her stomach for her puppies to eat when she has not a sufficiency of milk for them. If fed with chicken bones she does not throw them up; but contrives to retain them. This is a proof, not only of the great

affection of animals for their young, but as shewing the means which nature has implanted in an animal of nourishing its offspring when the usual nutriment has not been sufficiently abundant. Indeed, the affection which animals shew for their young, forgetful even of their own preservation in their care and love for them, is not a little surprizing. In one of the late Sir William Hoste's letters, published in his Memoirs, is the following proof of it. He says, 'a 'remarkable instance of a monkey's sagacity and 'feelings happened to two of our officers when 'shooting, and which has determined me never to 'shoot one as long as I live. Coming home after a 'long fag, the purser saw a female monkey running 'along the rocks, and immediately fired: she fell, 'with her young one in her arms. On the purser 'coming up, she grasped her little one close to her 'breast, and with her other hand pointed to the 'wound which the ball had made, and which had 'entered above the breast. Dipping her finger in 'the blood, and then holding it up, she seemed to 'reproach him with being the cause of her death, 'and consequently that of the young one, to which 'she frequently pointed. I never felt so much as 'when I heard the story, and it serves to shew how 'strongly the parental feelings are implanted by Na-'ture even in the brute creation.'

Every fresh instance of the affection of animals for their young under unusual circumstances is worthy of being recorded. It places them before us, not only in an interesting manner, by shewing how

strongly Almighty Providence has rendered the animal creation attentive to the care of their young, but as evincing also the fearlessness of danger, the absence of all self-regard, and that maternal anxiety and love which is possessed, equally by irrational as well as rational beings. A proof of this extraordinary affection came lately under my own observation. In cutting down some trees on the estate, recently purchased by the Crown at Petersham for the purpose of being annexed to Richmond park, the axe was applied to the root of a tall drawn up tree, on the top of which was a squirrel's nest. A rope was fastened to the tree for the purpose of pulling it down more expeditiously; the workmen cut at the roots, the rope was pulled, the tree swayed backwards and forwards, and at last fell. During all these operations a female squirrel never attempted to desert her new-born young, but remained with them in the nest. When the tree fell down she was thrown out of the nest and secured unhurt, and was put into a cage with her young ones. She suckled them for a short time, but refused to eat. Her maternal affection, however, remained to the last moment of her life, and she died in the act of affording all the nourishment in her power to her offspring.

> ' 'Tis merry, 'tis merry, in the good green wood,
> ' When the mavis and merle are singing,
> ' When the deer sweep by, and the hounds are in cry,
> ' And the hunter's horn is ringing.'
>
> SIR W. SCOTT.

I AM writing this surrounded by all the charms of a delicious spring morning. The early buds are beginning to open—the choir of nature hymns its song of joy and hope, and every thing is various, gay and smiling, as if looking forward to the prospect of a delightful summer. Indeed the wild singing of the birds, ' rejoicing in the return of brightness to the earth,' and making the whole air vocal with the bursting happiness of their new enjoyments—the busy hum of animated beings rising up from hill—and dale—and wood, and joining with their song upon the breeze—' all these speak of refreshed, of ' renovated existence.' Flowers begin to paint the fields—blossoms hang upon the trees, and I can fancy Flora shaking her light tresses in the morning air, and sprinkling it with sweet odours.

> ' The morn is up again, the dewy morn,
> ' With breath all incense, and with cheek all bloom ;
> ' Laughing the clouds away with playful scorn,
> ' And living as if earth contained no tomb.'
>
> CHILDE HAROLD.

Amongst the agreeable sounds we hear in the country, particularly on a fine still evening in the

spring, the cry of the Corn-crake or Land Rail (Ortygometra crex) is one which I always listen to with peculiar pleasure. The nest of this bird is rarely found, and I have never yet been able to procure one, though the bird is far from being scarce in this neighbourhood. It is said to lay from fifteen to twenty eggs, and yet it is seldom that we find more than two of the birds in the same field in the autumn. They probably congregate before they migrate, as I am assured that a considerable number were on one occasion seen together near the sea-shore in the neighbourhood of Swansea at the latter end of October, that being the time they usually take their departure from this country. I have met with an incident in the Natural History of the Corn-crake which I believe is perfectly accurate, having been informed that the bird will put on the semblance of death when exposed to danger from which it is unable to escape. The incident was this—a gentleman had a Corn-crake brought to him by his dog, to all appearance quite dead. As it lay on the ground, he turned it over with his foot and was convinced that it was dead. Standing by, however, in silence, he suddenly saw it open an eye. He then took it up—its head fell—its legs hung loose, and it appeared again quite dead. He then put it in his pocket, and before long he felt it all alive, and struggling to escape. He then took it out—it was as lifeless as before. Having laid it again upon the ground and retired to some distance, the bird in about five minutes warily raised its head, looked round, and decamped at full speed.

I have seen a similar circumstance take place with a partridge, and it is well known that many insects will practise the same deception. I have also observed it in that curious marine insect the sea-mouse, (Aphrodita Aculeata?)

I delight to hear, on a quiet still evening, the Nuthatch (Sitta europæa) as it taps upon the trunk or branch of a tree. I like to watch this bird during its restless operations as it moves round the branch, sometimes above, and sometimes under it, its strong claws enabling it to perform its evolutions with perfect ease; the noise it makes may be heard at some distance. These birds are very impatient in a state of confinement, hammering with their bills, and using every means to make their escape. An agreeable account of one of them is given by a correspondent in the Magazine of Natural History, and it is to be regretted that similar remarks are not more frequently communicated to the public, by those who may have opportunities of observing the manners and habits of animals. I need not, perhaps, add that I should be very grateful for any information on the subject which may be sent to me.

In the account of the Nuthatch above referred to, it is stated that on putting it into a cage, he produced a knocking sound with his beak which made the room re-echo, and continued it till nine or ten o'clock at night. He attacked a lark which was in the same cage with so much violence, that they were obliged to be separated. He eat and drank with the most perfect impudence, and having satisfied himself,

turned again to his work of battering the frame of the cage, the sound from which, both in loudness and prolongation of noise, could only be compared to a footman's knocking at a door. He had a particular fancy for the extremities of the corner pillars of the cage; on these he spent his most elaborate taps, so that the wood was pierced and worn like a piece of worm-eaten timber. His hammering was peculiarly laborious, for he did not peck as other birds do, but grasping his hold with his immense feet, he turned upon them as with a pivot, and struck with the whole weight of his body, thus assuming the appearance with his entire form of the head of a hammer. His labour was incessant, and he eat as largely as he worked, the united efforts of which probably killed him. The apparent intelligence of this bird's character, the speculation in his eye, the assiduity of his labour, and his most extraordinary fearlessness and familiarity, though coupled with fierceness, caused his death to be much regretted by his kind-hearted owner and his family.

Mr. White states that the knocking of a Nuthatch may be heard at the distance of a furlong. Its beak is peculiarly well formed for penetrating nuts in order to extract the kernels. It is stated that after death this bird emits a smell like that of exploded gunpowder. Its tongue is not capable of extension, as is the case with woodpeckers.*

* The Nuthatch like the Mouse, probably lays up a winter store of food, as Mr. White mentions having seen them bring out and crack their nuts on the 17th of March.

During my walks in Bushy Park in a spring evening, I hear a strange noise, occasioned by the croaking of frogs in a pond. This noise is different from any I have yet heard produced by that animal, and I was some time in ascertaining from whence it proceeded. On walking round the pond, I have seen a few frogs in the act of croaking, but not a sufficient number to enable me to account for the noise I heard at a greater distance, and which diminished as I approached the water. There is a strong echo in that part of the Park, which may possibly account for the different variations of sound.

I have remarked that frogs generally begin their croak about the time of the setting of the sun, and I am persuaded that this is done, not to call each other, but as producing a pleasurable sensation, as I have never known frogs croak while in a state of confinement. In the day time they are differently employed, and it is perhaps not generally known that when they are seen, in fine weather, with their heads only out of water, it is for the purpose of feeding on flies. When they are in this situation, and perceive a fly or gnat near them, they dart at them with the greatest quickness, putting out their tongues at the same instant, when they seldom fail to secure their prey. An observant friend informed me that several frogs had taken possession of an old well in his garden, which had been nearly filled up, though there was water amongst the broken bricks in it. The frogs might be seen with their heads at the edge of the bricks waiting for flies to settle upon

them. Three or four inches was the extreme distance at which the frogs ventured to make their darts. If the fly settled further than that, the frogs waited till it approached nearer, and then they generally secured it. Frogs during the winter cluster together like bees, at the bottom of ponds and deep ditches.

Of Gilbert White himself I could collect few personal reminiscences; and all that an old dame, who had nursed several of the family, could tell me of a philosophical old bachelor, was, that 'he was a still, quiet body, and that there was not 'a bit of harm in him.'

ANON. New Monthly.

My readers will not, I am sure, be displeased at my introducing in this place some extracts from Mr. White's unpublished papers. I should at the same time make them aware that these papers have been already picked and culled for the last edition of the Natural History of Selborne. Still, however, like the washings of sand where gold is known to exist, some particles of the precious metal may remain, which will amply reward the search. Those who have had the pleasure of perusing the more valuable materials, will, therefore, I trust not object to a view of the lighter ones. I have made the selection without any regard to order. What interested me, may interest others, and this alone has guided my choice.

I ought perhaps to apologize for having introduced some of Mr. White's remarks, not connected with Natural History, but referring to his domestic economy, and little incidents which had a connec-

tion with his private habits and mode of life. It is, however, perhaps from these very circumstances that one is able to know him more intimately, and to judge more accurately of the excellence of his heart and the earnestness with which he followed his favourite pursuit.

The Natural History of Selborne is now become a standard work, and will be read as long as the English language lasts. Every little circumstance, therefore, relating to its author, must, I think, be interesting, especially to those, who, like myself, are amongst his enthusiastic admirers. Boswell made us acquainted with Dr. Johnson by trifling details and desultory remarks, and for the same reason I have not scrupled to introduce some of Mr. White's memoranda, which might otherwise appear too minute for notice. Mr. White, however, observed all the little occurrences of his neighbourhood, and it is from these remarks that we are indebted for his delightful work.*

'He was strongly attached to the charms of rural 'scenery, and early fixed his residence in his native vil-'lage, where he spent the greater part of his life in 'literary occupations, and especially in the study of

* It has been said of him that these remarks do him credit, not only as a Naturalist, but as a man and a philosopher, in the truest sense of the word, for were we enabled to trace the works of Nature, minutely and accurately, we should find not only that every bird, but every creature, was equally well adapted for the purpose for which it was intended.

'nature. This he followed with patient assiduity, 'and a mind ever open to the lessons of piety and 'benevolence which such a study is so well calcu-'lated to afford. Thus his days passed, tranquil and 'serene, with scarcely any other vicissitudes than 'those of the seasons, till they closed at a mature 'age.'

MISCELLANEOUS OBSERVATIONS, SELECTED FROM THE MANUSCRIPTS OF THE LATE GILBERT WHITE OF SELBORNE.

'Sept. 15. Martins cling and cluster in a very 'particular manner against the wall of my stable and 'brew-house—also on the top of the may-pole. This 'clinging, at this time of year only, seems to me to 'carry somewhat significant with it.'

'Dogs eat the gooseberries when they become 'ripe; and now they devour the plums as they fall. 'Last year they tore the apricots off the trees.'

'The Cat gets on the roof of the house and 'catches young bats as they come forth from behind the sheet of lead at the bottom of the chim-'ney.'

'Colchicum is in flower.

> 'Say what retards, amidst the Summer's blaze,
> 'Th' autumnal bulb, 'till pale, declining days?'

'Kept a young Fern-owl in a cage for some days and fed it with bread and milk. It was moping and mute by day, but, being a night bird, began to be alert as soon as it was dusk; often repeating a little hissing note. Sent it back to the brakes among which it was first found.'

'About October 1, the weather was cold and wet 'at Vevey in Switzerland, when the Hirundines flew 'so near the ground as to be a prey to cats, which 'watched for them; and some entered men's win- 'dows so tame and hungry as to sit on a finger, and 'take flies when offered to them, or which they saw 'on the glass and walls.'

Salt of Tartar
Oil of Vitriol
0 0 0 0 Tea Kettle 0 0 0 0
Sea Salt
Wood-ashes
Coal-ashes
Nitre

'with the abovementioned articles brother Thomas 'has attempted to make a fairy-ring, circle within 'circle, and we are to take notice in the spring which 'circle, and whether any, will produce grass of a 'deeper green than before. The tea kettle which 'has occasioned the dots was set out, time after time, 'full of boiling water. The circles made with oil of 'vitriol, with sea salt, and with saltpetre, have dis- 'coloured the grass. Those with salt of tartar, wood 'and coal ashes have no visible effect at present. The 'grass seems killed where the kettle stood.'*

* The Fungi tribe, from their circular shape, shed their seed in a circle around them. This in time produces regular circles or segments. The freshness of the grass is probably produced by the moisture derived from the fungi. A man on the Brighton

'I have often observed many Titmice in beechen 'woods. By a heap of beech-mast now lying in my 'orchard I see that titmice feed on the kernels of the 'fruit of that tree, and that marsh titmice are em- 'ployed all day in carrying them away.'

'I sent a woman up the hill with a peck of beech- 'mast which she tells me she has scattered all round 'the down amidst the bushes and brakes, where 'there were no beeches before. I also ordered Tho- 'mas to sow beech-mast in the hedges all round 'Baker's Hill.' *

'A Bittern was shot in Shrub wood. A dog 'hunted it on the foot and sprung it in the covert. 'On the same day Mr. Yalden shot one in a coppice 'in the parish of Emshot, and about the same time 'one was killed in the parish of Greatham. These 'birds are very seldom seen in this district, and are 'probably driven from their watery haunts by the 'great floods, and obliged to betake themselves to 'the uplands. The wings expanded measured just 'four feet. The tail-feathers, shafts and all were 'just five inches long and ten in number. The neck 'feathers were very long and loose, like those on the

Downs, who was employed in digging for flints just below the surface of the turf, assured me that when he worked under a fairy ring he never could perceive any difference in the sub-soil.

* In recording this little instance of Mr. White's fondness for Natural scenery, I should not omit to mention, that he was then so far advanced in life that he could not expect to see the result of his endeavours to improve the beauty of his neighbourhood.

'neck of a roost cock. These birds weighed un-
'drawn and feathers and all, each 3 lbs. and 2 oz.
'The serrated claw on each middle toe is very curi-
'ous. Though the colours on the bittern's wings
'and back are no ways gaudy or radiant, yet are the
'dark and chestnut streaks so curiously blended and
'combined, as to give that fowl a surprizing beauty.
'Both the upper and lower mandible are serrated to-
'wards the point, and the upper is emarginated. Two
'of these birds I dressed, and found the flavour to
'be like that of a wild duck, or teal, but not so de-
'licate. They were in good case, and their intes-
'tines covered with fat. In the crop or gizzard I
'found nothing that could inform me on what they
'subsisted: both were quite empty. I found nothing
'like the flavour of a hare. The flesh of these birds
'was very brown. These bitterns were probably all
'of the same family.'

'The Red-breast sings throughout the whole year,
'except when in deep moult.'

'Swallows carry straws to mix with the dirt they
'collect for building their nests. The house-martins
'do not.'

'Swifts arrive in pairs.'

'The House-martin begins to build as early, as
'when it arrives early.'

'The Fern-owl is the last bird of passage but one;
'the Fly-catcher is the last, and is punctual to the
'20th of May. It begins building immediately on
'its arrival.'

'Feb. 25. The Titmouse, which at this time of the

'year begins to make two quaint sharp notes, which
'some people compare to the whetting of a saw, is
'the marsh titmouse. It is the great titmouse which
'sings those three cheerful notes which the country
'people say sounds like "sit ye down;" they call the
'bird by that name.'

'The Hawk *proinith,* says the new glossary to
'Chaucer; that is picketh, or dresseth her feathers—
'from hence the word *preen*—a term in ornithology,
'when birds adjust, or *oil* their feathers.'

'April 5. Searched the south-east end of the
'hanger for House-martins, but without any success,
'though many young men assisted. They examined
'the beechen shrubs, and holes in the steep hanger.
'Whilst the labourers were examining the shrubs
'and cavities, a house-martin came down the street
'and flew into a nest under Benham's eaves. This
'appearance is rather early for that bird. Quære,
'whether it was disturbed by the men on the hill.'*

* I doubt much whether Mr. White, with all his kindness of disposition, would have been pleased with any one for controverting his favourite theory of the annual hiding or submersion of swallows. From the beginning to the end of his eight volumes of observations, he never abandons the idea, and his friend Mr. Daines Barrington confirmed him in it. One is pleased with his perseverance and activity in endeavouring to elucidate this curious subject, and I can picture to my fancy the amiable Naturalist, attended by the village labourers, ascending the *beechen* hangers and pursuing their researches under his directions. They might wonder and smile at his curiosity on the occasion, but there can be no doubt of his having been respected and beloved by them.

'July 2. About 8 in the evening, Swifts get to-
'gether in a large party, and course round the en-
'virons of the church, as if teaching their broods
'the art of flying. As yet they do not retire until
'three quarters after 8 o'the clock; and before they
'withdraw, the *bats* come forth: so that day and
'night animals take each others places in a curious
'succession! All the swifts that play around the
'church do not seem to roost under its eaves. Some
'pairs, I know, reside under some of the cottage
'roofs. Swifts are sometimes so numerous that one
'might suspect they are joined by parties from other
villages.'

'Black-birds and thrushes come in troops to plun-
'der my garden. The white-throats are bold thieves,
'nor are the red-breasts at all honest with respect to
'currants. Birds are guided by colour, and do not
'touch any white fruits, till they have cleared all the
'red.'

'When I approach Bank-martins at their caverns,
'they seem anxious and utter a little wailing note.'

'I have known whole broods of Ducks killed by
'eating too freely of hairy caterpillars.'

'Red-breasts whistle agreeably on tops of hop-
'poles, but are prognostic of autumn. They feed
'on elder-berries—enter rooms and spoil my fur-
'niture.'

'May 11. One of my neighbours, an intelligent
'and observing man informs me, that about ten mi-
'nutes before 8 o'clock in the evening he discovered
'a great cluster of house Swallows, thirty at least

'he supposes, perching on a willow that hung over 'the verge of James Knight's upper pond. His at-'tention was first drawn by the twittering of these 'birds, which sat motionless in a row on the bough, 'with their heads all one way, and by their weight 'pressing down the twig so that it nearly touched 'water. In this situation he watched them till he 'could see no longer. Repeated accounts of this 'sort, spring and fall, induce me greatly to suspect 'that *house swallows* have some strong attachment to 'water independent of the matter of food; and that, 'if they do not retire into that element, they conceal 'themselves in the banks of pools and rivers during 'the uncomfortable months of winter.'

'May 31. This evening Chafers begin to fly in 'great abundance. They suit their appearance to 'the coming out of the young foliage, which in 'kindly seasons would have been much earlier.'*

'The farmers say, that the chafers, which abound 'in some parts, fall off the hedges and trees on the 'sheep's backs, where being entangled in the wool

* This has always appeared to me a curious fact in Natural History. In a very backward spring, I have found Chafers just below the surface of the soil appearing perfect and brisk and ready to come forth, and yet they have not done so for a long time afterwards. In fact not till the leaves had appeared on the trees. It must have been an extraordinary instinct which kept these insects in the recesses of the earth till the trees were clothed with verdure. One or two fine hot days did not tempt them out, and as Mr. White remarks, they suited their appearance to the coming out of the young foliage.

'they die, and being blown by flies, fill the sheep
'with maggots.'

'June 25. The sun at setting shines along the
'hanger just in these long days, and tinges the stems
'of the tall beeches of a golden colour in a most
'picturesque and amusing manner!!'

'Just at the summer solstice the sun at setting
'shines directly up my broad walk against the urn
'and tall fir.'

'The grass-hopper Lark *whispers.*'

'A pair of Partridges haunt Baker's Hill and
'dust themselves along the verge of the brick-
'walk.'

'Quantity of rain from January 1, to August 1,
'is 36 inches 1 h.!!!'

'A very intelligent clergyman assured me, that
'hearing, while he was a young student at the Uni-
'versity of Oxford, of Toads being found alive in
'blocks of stone and solid bodies of trees, he one
'long vacation took a toad, and put it in a garden
'pot, and laying a tile over the mouth of the pot,
'buried it five feet deep in the ground in his father's
'garden. In about thirteen months he dug up the
'imprisoned reptile and found it alive and well, and
'considerably grown. He buried it again as at the
'first, and on a second visit at about the same pe-
'riod of time found it circumstanced as before. He
'then deposited the pot as formerly a third time,
'only laying the tile so as not quite to cover the
'whole of its mouth: but when he came to examine
'it again next year, the toad was gone. He each

'time trod the earth down very hard over the
'pot.'

'I have seen no Fieldfares. If they come, as
'Ray says they do, 'ventis vehementer spirantibus,'
'they can have had no advantage of that kind, as
'the weather has been remarkably still.'

'20th May. Nightingales have eggs. They build
'a very inartificial nest with dead leaves and dry
'stalks. Their eggs are of a dull olive colour. A
'boy took my nest with five eggs, but the cock con-
'tinues to sing, so probably they will build again.'

'The sweet peal of bells at Farnham, heard up
'the vale of a still evening, is a pleasing circum-
'stance belonging to this situation, not only as occa-
'sioning agreeable associations in the mind, and re-
'membrances of the days of my youth, when I once
'resided in the town, but also by bringing to one's
'recollection many beautiful passages from the poets
'respecting this tunable and manly amusement, for
which this island is so remarkable. Of these none
are more distinguished and masterly than the fol-
lowing:

> 'let the village bells, as often wont,
> 'Come swelling on the breeze, and to the sun
> 'Half set, ring merrily their evening round.'—
>
> 'It is enough for me to hear the sound
> 'Of the remote, exhilarating peal,
> 'Now dying all away, now faintly heard,
> 'And now with loud, and musical relapse
> 'In mellow changes pouring on the ear.'

THE VILLAGE CURATE.

'There is a glade cut through the covert of the 'Holt opposite my windows up towards the great 'lodge. To this opening a herd of deer often re-'sorts, and contributes to enliven and diversify the 'prospect, in itself beautiful and engaging.'

'On the 6th of October I saw many Swallows 'hawking for flies round the Plestor, and a row of 'young ones, with square tails, sitting on a spar of 'the old ragged thatch of the empty house. This 'morning Dr. Chandler and I caused the roof to be 'examined, hoping to have found some of those 'birds in their winter retreat; but we did not meet 'with any success, though Benham (a labourer) 'searched every hole, and every breach in the decayed 'roof.'

'When Thomas (his old servant) got up to brew 'at 4 o'the clock he heard some stone Curlews pass 'by over the house in their way to the uplands. In 'the evening they flie over the village downwards, 'towards the brook and meadows, where they seem 'to spend the night.'

'There is a bird of the black-bird kind, with 'white on the breast, that haunts my outlet, as if it 'had a nest there. Is this a Ring-ousel? If it is, 'it must be a great curiosity, because they have not 'been known to breed in these parts.'

'James Knight has observed two large Fieldfares 'in the high wood lately, haunting the same part, as 'if they intended to breed there. They are not wild. 'A nest of this sort of bird would be a great cu-'riosity!'

'Made Rhubarb tarts, and a rhubarb pudding, 'which was very good.'

'A Martin has built its nest against the glass of a 'window. It seems to stick firmly, and has no other support.'

'Mrs. Barker and her daughters, Mary and Elizabeth, and Mrs. Chandler and her infant daughter and nursemaid went this day (August 19), all in a cart to see the great Oak in the Holt, which is 'deemed by Mr. Marsham of Stratton in Norfolk to 'be the biggest in this Island. Brother Thomas and 'Dr. Chandler rode on horseback. They all dined 'under the shade of this tree. At seven feet from 'the ground it measures in circumference 34 feet— 'has in old times lost several boughs, and is tending 'towards decay. Mr. Marsham computes that at 14 'feet length this oak contains 1000 feet of timber.'

'I conclude that the Holiburne trufler finds encouragement in our woods and hangers, as he frequently passes along the village. He is a surly fellow and not communicative. He is attended by 'two little cur dogs, which he leads in a string.'

'Oct. 24th, a flock of 46 Ravens over the hanger.'

'Chiff-chafs are usually first heard about the 21st of March. These birds, no bigger than a man's thumb, fetch an echo out of the hanger at every note.'

'May 3. Set the old Bantam speckled hen with eleven eggs. My cookmaid desired there might be an odd egg for good luck,

'numero Deus impare gaudet.'

'My brother's Cow, when there is no extraordi-
'nary call for cream, produces three pounds of but-
'ter each week. The footman churns the butter over
'night, and puts it in water. In the morning one
'of my nieces beats it and makes it up and prints it.'
(*Tempora mutantur*).

'Aug. 5. Young Martins and Swallows cluster
'on the tower of the church and on trees for the
'first time. A pleasing circumstance mixed with
'some degree of regret for the decline of summer.'

'Received from Farnham, well packed in a box, a
'picture of a male Pheasant, painted by Mr. Elmer,
'and given me by Lord Stawell. I have fixed it in
'a gilt burnished frame, and hung it in my great
'parlour, where it makes an elegant piece of furniture.'

'When the boys bring me Wasps' nests, my ban-
'tam fowls fare deliciously, and when the combs are
'pulled to pieces, devour the young wasps in their
'maggot state with the highest glee and delight.
'Any insect-eating bird would do the same, and
'therefore I have often wondered that the accurate
'Mr. Ray should call one species of buzzard *Buteo*
'*apivorus, sive vespivorus*, or the *Honey Buzzard*, be-
'cause some combs of wasps happened to be found in
'one of their nests. The combs were conveyed
'thither doubtless for the sake of the maggots, or
'nymphs, and not for their honey, since none is to
'be found in the combs of wasps.* Birds of prey
'occasionally feed on insects. Thus I have seen a

* The honey-buzzard is evidently a link between the rapaci-
ous and insectiverous tribes. One, which was killed, was full of

'tame kite picking up the female ants, full of eggs, 'with much satisfaction.'

'The congregating flocks of Hirundines on the 'church and tower are very beautiful and amusing! 'When they fly off altogether from the roof on any 'alarm, they quite swarm in the air. But they soon 'settle in heaps, and preening their feathers and lift- 'ing up their wings to admit the sun, seem highly to 'enjoy the warm situation. Thus they spend the 'heat of the day, preparing for their emigration, and 'as it were consulting when and where they are to 'go, in order to avoid the coming winter.

> 'In warmer climes,
> 'They twitter cheerful, till the vernal months
> 'Invite them welcome back.'

'Oct. 24. The dams continue to feed some poor 'little Martins in a nest at Burbey's with great assi- 'duity. Oct. 28. There are apparently three young 'martins in the nest nearly fledged. Nov. 1. The 'young martins are out, one was found dead this 'morning in the parsonage garden. Nov. 2. Snow 'covers the ground.'

'Saw lately a white and a yellow Wagtail about the 'Well head rivulet. No further North than Rutland, 'wagtails withdraw, and are never seen in the winter.'

'March 17, Lord Stawell made me a visit on this 'day, and brought me a white Woodcock, its head, 'neck, belly and sides, were milk-white, as were the 'under sides of the wings. On the back, and upper

the larvæ of wasps. It has analagous conformations with the tribes of the Cuckoo and Goatsucker.

'parts of the wings were a few spots of the natural 'colour. From the shortness of the bill I should 'suppose it to have been a male bird. It was plump 'and in good condition.'

'May 22. The Fly-catcher comes to my vines, 'where probably it was bred, or had a nest last year. 'It is the latest summer bird, and appears almost to 'a day!

'Amusive bird, say where your hid retreat!'

'Hung the nets over the cherry trees at the end of 'the house to keep off the Magpies, which come to 'our very windows between three and four in the 'morning. The Daws also from the church have in-'vaded my neighbours' cherries. Pies and daws are 'very impudent!'

'Mrs. [illegible]leigh says that the churring of the Fern 'owl is like the noise of a razor-grinder's wheel.'

'Farmer Hoare's son shot a hen Wood-chat or 'small butcher bird as it was washing at Well-head, 'attended by the cock. It is a rare bird in these 'parts. In its craw were insects.'

'The poet of Nature lets few moral incidents 'escape him. In his Summer he mentions the whet-'ting of a scythe as a pleasing circumstance, not 'from the real sound, which is harsh, grating, and 'unmusical; but from the train of summer ideas 'which it raises in the imagination. No one who 'loves his garden and lawn but rejoices to hear the 'sound of the mower on an early, dewy morning.'

'Echo no more returns the *chearful* sound
'Of sharpening scythe.'

'Milton also, as a pleasing summer morning oc-'currence, says,

'the mower whets his scythe.' L'ALLEGRO.

'July 24. The loud humming of bees, though 'none are to be seen, was very audible on the 'down, from the mossy-dells almost to Mr. White's 'avenue.'

'Young Buzzards follow their dams with a piping, 'wailing noise.'

'Heard's well is 250 feet to the bottom. Deep 'and tremendous as it is, John Gillman, an idiot, 'fell to the bottom of it twice in one morning, and 'was taken out alive, and survived the strange acci-'dent for many years.'

'Sept. 9. As most of the second brood of Hirun-'dines are now out, the young on fine days congre-'gate in considerable numbers on the church and 'tower: and it is remarkable that though the gene-'rality sit on the battlements and roof, yet many 'hang or cling for some time by their claws against 'the surface of the walls in a manner not practised 'at any other time of their remaining with us. Swal-'lows congregate more on trees.'

'Thomas saw a Pole-cat run across the garden.'

'Saw a Squirrel in Baker's Hill: it was very 'tame. This was probably what Thomas called a 'pole-cat.'

'Thomas started a Hare, which lay in her form 'under a cabbage in the midst of my garden. It had 'begun to eat my pinks.'

'My brother's lambs frolick before the windows, 'and run to a certain hillock, which is their goal, 'from whence they hurry back, and put us in mind 'of the following passage,—

> 'Now the sprightly race
> 'Invites them forth: then swift, the signal given,
> 'They start away, and sweep the mossy mound
> 'That runs around the hill.'

'Large Woodpecker *laughs* very loud.'

'I observe that the Nightingale comes as early in 'cold cutting springs as mild ones!'

'Jan. 6. Boys play at *taw* on the Plestor.'

'Brown Wood-owls come down from the hanger 'in the dusk of the evening, and sit hooting all night 'on my walnut trees. Their note is like a fine vox 'humana, and very tuneable. The owls probably 'watch for mice about the buildings. White owls 'haunt my barn, but do not seem to perch often on 'trees.'

'The cats brought in a dead House-martin from 'the stable. I was in hopes at first sight that it 'might have been in a torpid state, but it was de-'cayed and dry.'

'Set *Gunrory* the Bantam hen on nine of her own 'eggs.'

'The Squirrel, the Field-mouse, and the bird 'called a Nuthatch, (sitta europæa) live much on 'nuts, which they open each in a very different man-'ner. The first splits the shell in two with his long 'fore teeth, as a man does with his knife: the second

'drills a small round regular hole in the side of the
'nut: while the last picks an irregular hole with its
'bill. This bird fixes the nut in some chink or cre-
'vice, as it were in a vice, before he attempts to
'open it. The space behind my alcove is covered
'with the shells of nuts which the bird had bored
'after he had fixed them in the corners of the cornice
'of that edifice. While it is penetrating a nut, it
'makes a rapping noise with its bill which may be
'heard at some distance.'

'Nov. 17. Spent three hours of this day, viz. from
'one o'the clock till four, in the midst of the Downs
'between Andover and Winton, where we should have
'suffered greatly from cold and hunger, had not the
'day proved very fine, and had not we been opposite
'to the house of Mr. Tredgold's down farm, where
'we were hospitably entertained by the labourer's
'wife with cold sparerib and good bread and cheese,
'and ale, while the driver went back to Andover to
'fetch a better horse. During our long conversation
'with the dame, we found that this lone farm-house
'and its buildings, though so sequestered from all
neighbourhood, and so far removed from all streams,
'and water, are much annoyed with Norway rats.
The carter also told us that about 12 years ago he
had seen a flock of 18 bustards at one time on that
farm, and once since only two. This is the only
habitation to be met with on these Downs between
Whorwell and Winchester.'

'Dec. 27. A House-fly (musca domestica) by the
warmth of my parlour has lengthened out his life

'and existence to this time. He usually basks on 'the jams of the chimney within the influence of the 'fire after dinner, and settles on the table, where he 'sips the wine and tastes the sugar and baked apples. 'If there comes a very severe day he withdraws, and 'is not seen.' *

* Let me here introduce an anecdote of a fly communicated to me by a friend to whom I am indebted for some other remarks. 'Many years since, I believe about forty, Slingsby, 'the celebrated opera dancer, with whom I was acquainted, 'resided in the large house in Cross-deep, Twickenham, next to 'Sir Wathen Waller's, looking down the river. He was, like 'the author of the "Gleanings," fond of the study of Natural 'History, and particularly of insects, and he told me that he 'once tried to tame some house-flies and preserve them in a 'state of activity through the winter. For this purpose, quite 'at the latter end of Autumn, and when they were becoming 'almost helpless, he selected four from off his breakfast table, 'put them upon a large handful of cotton, and placed it in one 'corner of the window nearest the fire-place. Not long after-'wards the weather became so cold, that all flies disappeared 'except these four, which constantly left their bed of cotton at 'his breakfast time, came and fed at the table, and then re-'turned to their home. This continued for a short time, when 'three of them became lifeless in their shelter, and only one 'came down. This, Slingsby said, he had trained to feed upon 'his thumb-nail, by placing on it some moist sugar mixed with 'a little butter. Although there had been at intervals several 'days of sharp frost, the fly never missed taking his daily meal 'in this way till after Christmas, when his kind preserver 'having invited a friend to dine and sleep at his house, the fly, 'the next morning, perched upon the thumb of the visitor, 'who, being ignorant that it was a pet of his host's, clapped 'his hand upon it, and thus put an end to Mr. Slingsby's ex-'periment.'

'Mr. Ventris observed at Faringdon a little whirl-
'wind, which originated in the road before his house,
'taking up the dust and straws that came in its way.
'After mounting up through one of the elms before
'the yard, and carrying away two of the rooks' nests
'in which were young squabs, it then went off, leaving
'the court yard strewed with dust and straws, and
'scraps of twigs, and the little naked rooks sprawl-
'ing on the ground. A pair of rooks belonging to
'one of these nests built again, and had a late
'brood.'

'Sheared my mongrel dog Rover, and made use
'of his white hair in plaster for ceilings. His coat
'weighed four ounces. A Blackbird has made a
'nest in my barn on some poles that lie on a scaf-
'fold.'

'A Cat gets down the pots of a neighbour's chim-
'ney after the swallows' nests.'

'The clatter and jingle of a violent hail storm on
'glass, would put a man in mind of that beautiful and
'expressive line in Virgil,

'Tam multa in tectis crepitans salit horrida grando.'

'July 27. We have had a few chilly mornings and
'evenings which have sent off the Swifts. I have
'remarked how early they are in their retreats.
'Surely they must be influenced by the failure of
'some particular insect which ceases to fly thus early,
'being checked by the first cool autumnal sensations,
'since their congeners will not depart yet these 8 or
'9 weeks.'

'A Bat comes out many times in a day, even in 'sunshine to catch flies. It is probably a female 'that has young, and is hungry from giving suck. 'The Swallows strike at the bat.'

'The prodigious crop of apples this year verified 'in some measure the words of Virgil made use of 'in the description of the Corycian garden;

> 'Quotque in flore novo pomis se fertilis arbos
> 'Induerat, totidem autumno matura tenebat.'

'Oct. 15. Vast quantities of Gossamer. The fields 'are covered with it;—

> 'slow through the air
> 'The gossamer floats: or stretch'd from blade to blade
> 'The wavy net-work whitens all the fields.'

'The Mice have infested my garden much by nest-'ling in my hot-beds, devouring my balsams, and 'burroughing under my cucumber-basins; so that I 'may say with Martial—

> 'Fines mus populatur, et colono
> 'Tanquam sus Calydonius timetur.'

'Where old Beech trees are cleared away, the 'naked ground in a year or two becomes covered 'with Strawberry plants, the seeds of which must 'have lain in the ground for an age at least. One 'of the *Slidders* or trenches down the middle of the 'hanger, close covered over with lofty beeches near 'a century old, is still called *Strawberry Slidder*, 'though no Strawberries have grown there in the

memory of man. That sort of fruit, no doubt, did 'once abound there, and will again when the obstruction is removed.'

'Dogs come into my garden at night and eat my 'gooseberries.'

'Wasps seize on butterflies, and shearing off their 'wings, carry their bodies home as food for their 'young. They prey much on flies.'

'Snake gorges a toad much larger than itself. 'When full, it is very sluggish and helpless, and 'easily taken.'

'White Butterflies innumerable. Woe to the 'cabbages.'

'April 26. As a notion has prevailed that Hirun-'dines on their first coming were lean and emaciated, 'I procured a house-martin to be shot as soon as it 'appeared, but the bird, when it came to be opened, 'was fat and fleshy. Its stomach was full of the legs 'and wings of small coleoptera.'

'A day or two before any House-martins had been 'observed, Thomas Hoar distinctly heard, pretty late 'one evening, the twittering notes of those birds from 'under the eaves of my brewhouse, between the ceil-'ing, and the thatch. Now the quere is, whether 'those birds had harboured there the winter through, 'and were just awakening from their slumbers, or 'whether they had only just taken possession of that 'place unnoticed, and were lately arrived from some 'distant district. If the former was the case, they went 'not far to seek for an hybernaculum, since they nestle 'every year along the eaves of that building.'

'Swifts always withdraw in wet and windy wea-
'ther.'

'My favourite old galloway, who is touched in his
'wind, was allowed to taste no water for 21 days, by
'which means his infirmity grew much less trouble-
'some. He was turned to grass every night, and
'became fat and hearty, and moved with ease. After
'refraining a while, he shewed little propensity for
'drink. A good lesson this to people, who, by per-
'petually guzzling, create a perpetual thirst. When
'permitted to drink, he shewed no eagerness for
'water.'

'Titmice creep into the martin's nests, and pro-
'bably eat the pupæ of the hippoboscæ hirundinis.'

'March 25. Picturesque, partial fogs, looking like
'seas, islands, rivers, harbours, hills, &c.!!'

'A pair of Creepers (Certhia) build at one end of
'the parsonage house at Greatham, behind some
'loose plaster. It is very amusing to see them run
'creeping up the walls with the agility of a mouse.
'They take great delight in climbing up steep sur-
'faces, and support themselves in their progress with
'their tails, which are long and stiff, and inclined
'downwards.'

'Sparrows take possession of the martin's nests.
'When we shot the cock, the hen soon found another
'male, and when we killed the hen, the cock soon
'procured another mate; and so on for three or four
'times.'

'Round the eaves of the Priory farm-house are
'40 Martins' nests, which have sent forth their first

'brood in swarms. At four young to a nest only, 'the first brood will produce 160, and the second the 'same, which together make 320. Add to these the '40 pairs of old ones, which make in all 400, a vast 'flight for one house!! The first, when congregating 'on the tiles, covers one side of the roof.'

'July 30. Young Snipes were seen at the Bishop 'of Winchester's table at Farnham Castle on this 'day. They had bred on all the moory heaths of this 'neighbourhood.'

'My pendent pantry, made of deal and fine fly 'wire, and suspended in the great walnut tree, proves 'an incomparable preservative for meat against flesh 'flies. The flesh, by hanging in a brisk current of 'air, becomes dry on the surface, and keeps till it is 'tender without tainting.'

'January 20. Mr. Hool's man says, that he caught 'this day, in a lane near Hackwood Park, many Rooks, 'which attempting to fly, fell from the trees with their 'wings frozen together by the sleet that froze as it 'fell. There were, he affirms, many dozens so dis-'abled. It is certain that Mr. Hool's man did bring 'home many rooks and give them to the poor neigh-'bours.'

'Sept. 3. One Swift was seen on this day at Lyn-'don, in the county of Rutland. In all our observa-'tions, Mr. Barker * and I never saw or heard of a 'Swift in September, though we have remarked them 'for more than forty years.'

'Fyfield, Oct. 23. My brother's children and plan-

* His brother-in-law.

'tations are strangely grown in two years. The gold
'and silver fish lie sleeping all day in their glass bowl
'towards the surface of the water. People that have
'attended to them suppose this circumstance to be
'prognostic of rain.'

"Nov. 19. Several Martins were playing about
'over the chalk-bank at the east end of Whorwell
'village. Can any one suppose but that they came
'out of that bank that morning to enjoy the warm
'sunshine, and would retire into it again before
'night?'

'No Hogs have annoyed us this year in my
'outlet. They usually force in after the acorns,
'nuts, beach and maple mast, and occasion much
'trouble.'

'The country people look with a kind of supersti-
'tious awe at the red lowering aspect of the sun
'through the fog—

'Cum caput obscurâ nitidum ferrugine texit.'

'July 7. Bees have thriven well this summer, be-
'ing assisted by the honey dews, which have abound-
'ed this year. Some of the standard honeysuckles,
'which a month ago were so sweet and lovely, being
'covered with aphides, and viscous honey dews.
'These latter are probably occasioned by the effluvia
'of flowers being drawn up by a brisk evaporation in
'hot days, and then in the night falling down with
'the dews.'*

* Honey dew is the exuviæ of insects. There are little
green aphides which harbour in small colonies under the leaves

'July 6, 1783. Some young Martins came out of 'the nest over the garden-door. This nest was built 'in 1777, and has been used ever since.'

'July 14. When the Owl comes out of an even-'ing, the Swifts pursue her, but not with any ve-'hemence.'

'Aug. 15. Took this morning, by bird lime on the 'tips of the hazel-twigs, several hundred Wasps that 'were devouring my gooseberries. A little attention 'this way makes vast riddance and havock among 'these plundering invaders.'

'Aug. 22. Caught about 100 Wasps in the fallen 'codlins, which were gnawn and scooped hollow.'

'Aug. 25. The boys broke up the arch of a 'bricked grave to get at a Wasp's nest. Paid for 'one wasp's nest full of young.'

'Oct. 3. The hanger is beautifully tinged. Leaves 'fall apace:

> 'see, the fading many-coloured woods,
> 'Shade deepening over shade, the country round
> 'Imbrown.' THOMSON.

'Oct. 4. The Cat frolicks and plays with the fallen 'leaves.'

'March 21. My Goose sits, while the gander with

and on the tender shoots of trees, from whence their *dew* is dropped on the leaves below. This is collected by Bees and Ants. The latter are very careful not to injure or disturb the insects, as I have frequently observed. It seems extraordinary that so observant a naturalist as Mr. White should have been ignorant of this circumstance.

'vast assiduity keeps guard, and takes the fiercest sow 'by the ear, and leads her away crying.'

'July 27. The White Owl has young. It brings 'a mouse to its nest about every five minutes, begin-'ning at sun-set.'

'Blood worms appear in the water: they are gnats 'in one state.'

'March 20. The Peacock, (pavo,) exerts his gal-'lantry when the hens appear,'—

> 'whose gay train
> 'Adorns him coloured with the florid hue
> 'Of rain bows, and starry eyes.' MILTON.

'May 19. Black-cap sings sweetly, but rather in-'wardly; it is a songster of the first rate. Its notes 'are deep and sweet. Called in Norfolk the mock-'nightingale.'

'Redwings whistle inwardly in this country—in 'their own they are good songsters.'

'The Green Wood-pecker seems to *laugh* at all the 'world.'

'Rooks will pursue and catch Cockchaffers as they 'fly.'

'The Peewit-gull or Black-cap (larus ridibundus) 'haunts inland pools, and sometimes breeds on them.'

'The Titlark will wade up to its belly in wet 'meadows in pursuit of the pupæ of insects, and 'sometimes run along upon the floating grass and 'weeds.' *

* The tree Pipit (Anthus arboreus) is one of our earliest singing birds, if not the first. I like to see it spreading out its

'In cold dry weather, all nature seems to stand 'still; birds do not sing, and the lambs do not frolic 'and play as usual.'

'acrior illos
'Cura domat.' VIRGIL.

'Hen Chaffinches will congregate till late in February. Their separation from the males for so 'great a part of the year is a curious fact.'

'Wrens whistle all the winter, except in severe 'frosts. They do this more than any other English 'bird in a wild state.'

'The Yellow-hammer hatches later than most birds, 'and then feeds her young with tipulæ.

'The Green Plovers appear in small companies on 'uplands. They fly high, and make a whistling.'

'The Fly-catcher appears to be the most punctual 'of all the birds of passage, and begins building as 'soon as it arrives, which is the 20th of May.'

'The Willow-wren has only two harsh, shrill notes. 'It is an early bird of passage.'

'Rooks and Crows destroy an immense number of 'chaffers. Was it not for these birds the chaffers 'would destroy every thing.'

'The Apis Longicornis only works at boring its 'nest in the ground in a morning while the sun 'shines on the walk.'

'Linnæus says, that Hawks "paciscuntur indu- 'cias cum avibus, quamdiu cuculus cuculat," but

its wings and taking short flights from one tree to another, singing as it descends on a branch.

'during that period many little birds are taken and 'destroyed by the birds of prey, as appears by their 'feathers left under hedges.'

'Nightingales are very jealous of their young, 'and make a jarring harsh noise if you approach 'them.'

'A young cock Chaffinch, before it moults, re-'sembles much the hen.'

'Spiders shoot their webs from clod to clod.'

'Brother Harry's strong beer, which was brewed 'with the Hordeum Nudum (naked barley) is incom-'parably good.'

'Sheep never touch the stalks of grasses, Rab-'bits do.'

'In the dusk of the evening, when beetles begin 'to buzz, Partridges immediately begin to call. These 'two circumstances are exactly coincident.'

'When Horses, Cows, Sheep, Deer, &c. feed in 'wind and rain, they always keep their heads down 'the wind and their tails to the weather; but birds 'always perch and choose to fly with their heads to 'the weather, to prevent the wind from ruffling their 'feathers, and the cold and wet from penetrating to 'their skins.'

'The latest summer birds of passage generally re-'tire the first. Birds are seldom joyous in dry springs. 'They are silent for the want of showers.'

'The year after a very dry summer, but few Shell-'snails are to be seen. They are destroyed and eaten 'by Thrushes.'

'Tortoise is very fond of kidney beans.'

'Wagtails, which generally keep near the ground, 'will mount to a great height, in order to mob a 'hawk.' (They shew great command of wing on the 'occasion.)

'Wasps plunder weak hives, and sometimes kill 'the bees;'

'asper crabro imparibus se emiscuit armis.'

'Worms do not seem to inhabit beyond vegetable 'mould.'

'The Buzzard is a dastardly bird, and beaten not 'only by the raven, but even by the carrion crow.'

'Naked snails seem to be more hardy than those 'which have houses on their backs.'

'The Nuthatch, though so small a bird, is able to 'penetrate walnuts.'

'Turkies are very fond of hazel-nuts, and swallow 'them whole.'

'Field-fares, when pressed by hunger, will feed on 'sloes, the last food they resort to in autumn.'

'Some labourers digging for stone, found in an 'hole in the rock a red-breast's nest containing one 'young Cuckoo, half fledged. The wonder was how 'the old cuckoo could discover a nest in so secret and 'sequestered a place.'

'Woolmer Forest produces young teals, and 'young large snipes; but no young jack snipes are 'found.'

'When the death's head Moth (sphinx atropos) is handled, it makes a little stridulous noise.'

'Barn-owls will sometimes come out in the day, 'taking their prey in the sunshine about noon.'

'A Nightingale is sometimes heard to sing late in 'July, but its notes are then short and interrupted, 'and attended with a chur.'

'Two young men killed a large male Otter, weigh-'ing 21 pounds, on the bank of our rivulet, below 'Priory long mead, on the Hartly wood side. This 'is the first of the kind ever remembered to have 'been found in this parish.'

'When the hen Fly-catcher sits on her eggs, the 'cock feeds her with great assiduity, even on till past '9 in the evening.'

'As the great Walnut tree has no foliage this year, 'we have hung the meat safe on Miss White's Syca-'more, which she planted a nut. Here it will be 'much in the air, and be well sheltered from the sun 'by leaves.'

'June 4. Crickets sing much on the hearth this 'evening; they feel the influence of moist air, and 'sing against rain.'

'A gentleman writes word from St. Mary's, Scilly, 'that in the night between the 10th and 11th of this 'month, the wind being west, there fell such a flight 'of Woodcocks within the walls of the garrison, that 'he himself shot and conveyed home 26 couple, be-'sides three couple which he wounded, but did not 'give himself the trouble to retrieve. On the fol-'lowing day, the 12th, the wind continuing west, he 'found but few.

'This person further observes, that easterly and

'northerly winds only have usually been remarked 'as propitious in bringing Woodcocks to those 'islands, viz. Scilly. So that he is totally at a loss 'to account for this western flight, unless they came 'from Ireland. As they took their departure in the 'night between the 11th and 12th, the wind still 'continuing west, he supposes they were gone to 'make a visit to the counties of Cornwall and Devon-'shire.

'From circumstances in the letter, it appears that 'the ground within the lines of the garrison abounds 'with furze. Some Woodcocks settled in the street 'of St. Mary's, and ran into the houses and out-'houses.'

'Wornils grow very large on the backs of cows. 'If they could be watched, so as to be taken when 'going into the pupa state, perhaps it might be dis-'covered from what insect they are derived.'

'Starlings and Lapwings congregate early. The 'latter about the first week in October.'

'Birds in their flights are joined by others, and 'thus large flocks congregate. Their number is 'probably determined by the supply of food re-'quired.'

'Bustards, when seen on the downs, resemble 'Fallow Deer at a distance.'

'The Reed-sparrow forsakes the reeds and water-'side in the winter, and roves about amongst the 'fields and hedges.'

'Birds sing less in August than any other month.'

'Vast numbers of Spiders are sometimes seen

'on water, in ponds, which dive and conceal them-
'selves on the underside of plants lying on the
'water. Their motions on the water are extremely
'rapid.'

In concluding my extracts from Mr. White's Manuscripts, I have felt very desirous of giving some account of him, but I find little more to say of him than what is already before the public. As far as I can collect from his Diary (if I may call it so) which is now in my possession, he appears to have been of retired habits, with a mind constantly employed in his favourite study, and enjoying that cheerful and happy disposition which such pursuits invariably bring with them. His time was almost entirely passed in his favourite and secluded village. He notices the visits which were from time to time paid him, and these were chiefly by his own relations. He carefully notes down all his nephews and nieces as they respectively came into the world, amounting to about 63, when his diary closed. He chronicled his beer, and takes notice of the quantity of port wine which came to his share when he had a pipe of it with his neighbours. He appears to have made annual visits at Lambeth, Ringmeer, and Oxford, and during these absences his old servant, Thomas, kept his weather journal. Mr. White passed much of his time in his garden, and he makes frequent mention of his crops, his fine and early cucumbers, and the flavour of his Cardilliac pears. He thought nothing too trifling to be recorded. The appearance of his

neighbours' hops, the beginning and ending of their harvests, their bees, their pigs, and poultry, are all noticed in succession, and appear to have added to the interest he took in rural life.

Insignificant as these little details may appear, they were not thought so by a man whose mind was stored with learning, possessing a cultivated and elegant taste for what is beautiful in nature, and who has left behind him one of the most delightful books in the English language—delightful not only for the agreeable information it contains, but also for its style and accuracy.

The following account of Selborne will, I am sure, be perused with interest by many of my readers. It is extracted from an entertaining article on that village in the New Monthly Magazine. The writer appears to have visited it out of pure love for the memory of Mr. White, and in consequence of the pleasure he had derived from his writings. After describing the neighbouring country, which he mentions as not very prepossessing, he adds, "It is only after you pass the first ridge of hills that you have any promise of beauty. Selborne Hanger then begins gradually to raise its leafy head in front, while the bold promontory of Nore Hill meets the eye with its swelling uplands to the left, and the high Sussex and Surrey range of downs melting into the blue distance beyond, close the prospect with a noble and expansive outline.

"But it is not until you reach the spot where the foot-path crosses the winding Alton Lane for the last time, about a quarter of a mile from the village, that

the full beauty of the valley of Selborne itself suddenly breaks upon the view; and a scene of more enchanting rural loveliness eye never beheld. A foot-bridge spans the deep-cleft ravine below, along which, at the depth of some twenty or thirty feet of precipitous rocky bank, a little torrent, though it was in the middle of summer, was brawling over the rugged track which forms both the channel of the stream and the only cart-way to the village. At my feet lay a fore-ground of corn fields, just ripening with the first golden tinge of autumn; and at the other side of the valley rose abruptly, to the height of three hundred feet, the luxuriant beech wood of the Hanger, with the white tower of the village church thrown against its rich green, and the sheltered parsonage and picturesque cottages scattered along the foot of the hill, and sending up their circling wreaths of smoke among the foliage. Along the descending side of the vale to the left, appeared the vicarage garden, separated by its snug enclosure from a paddock in the dell, on the declivities of which a few sheep and cattle hung quietly browzing; while the summit of the higher ridge was fringed by the young larches of the Lithe wood. To the right, farm-yards and cottage gardens, with hop-lands and corn-fields, again stretched away towards the Hanger, and bounded the scene in that direction: and near the Church, and in the midst of the village itself, that fine old emblem of rural sport, the May-pole, which now so rarely meets the view of the traveller either by high-ways or by-ways, 'rose 'tapering to the sky.'

"In the appearance of the cottages 'of good stone 'or brick, glazed, and with chambers above-stairs,' I recognised the same pristine air of industry and comfort which White has ascribed to them. He might still assert the pride of his village, that 'mud buildings there are none;' nor could I anywhere detect any trace of that heart-sickening spectacle of squalid abject pauperism, which now, alas! too often haunts our fairest island scenes of cultivation and abundance. On the contrary, chimneys reeking with evidence of clean hearths in full activity, walls neatly covered with vines and creepers in full bloom, and trim little gardens prank'd with flowers, seemed here to tell only of cheerful toil and decent competence, nor did it enter into the charmed fancy to enquire how often crime and wretchedness might disturb such a haven of rest. The whole landscape, indeed, so far surpassed expectation, as to seem almost too beauteous for reality; and I could not but acknowledge and marvel how far short even the naturalist's fond description of his favourite spot has fallen of its true features. The illusion of the moment may have been heightened by the season and the weather; for the sunny brilliancy of the deep blue sky was just dappled and tempered by the few summer clouds which threw their varying lights and shadows over the wooded uplands and cultivated dale. The traveller, therefore, who would 'view fair Selborne aright,' should humour the caprices of our fickle climate, and visit it only when its fields and foliage are clothed in their summer verdure or autumnal russet, and lighted up in genial sunshine;

for its beauty is of the joyous seasons, fitted neither to be obscured by the sullen influence of a rainy day, nor torn by the rude hand of winter. Descending into 'the single straggling street' of which the village consists, my steps were instinctively directed towards the Hanger, and I soon found myself climbing the winding path which was cut through the beech-wood in the time of Gilbert White. A sweeter spot than the interior of this thick covert, with its craggy slopes and 'graceful pendulous foliage,' it is impossible to conceive. The effect on entering its cool shades and deep twilight gloom, after the full blaze of the glowing sunshine, was most refreshing, and stole over the senses with a peculiar delight. The halcyon stillness which reigned around was here broken only by the hum of insects, and the tinkling of the bells from a herd of cattle, which the woodland being part of the village common ground, were turned loose in to graze. This custom of belling the cattle, I think, must be almost peculiar to this district, as I never remember to have met with it in England, at least except at Selborne and at Waltham Chace. It is here necessary to trace the straying cows at milking time through the common wood; and the charm of the scene was much encreased by the rural music, borne through the glades, as well as by occasional glimpses of the herd of that Norman breed, or Guernsey cross, now become so common in Hampshire, and which abounds in picturesque forms and colouring. Amidst this scene of exquisite repose, I drank up the fulness of its influence in one

of those rare moments of unutterable thrilling enjoyment, which recall the most vivid day-dreams of youth, and recur so seldom—so few and far between—in the cheerless realities of our later years.

"Here, seated in an arbour, which has been formed about half way up the Hanger, the traveller may catch the enchanting picture of the valley, with the advantage of a new point of view. An opening in the wood shows the whole village scattered at its base with 'that engaging prospect' in the plain country beyond of 'hill, dale, woodlands, heath, and water,' which White has so warmly commended, not beyond its merits. Through the glade below there is a surprise prepared for the visitor, for the eye suddenly falls on a little villa under the hill, which is planted out from the street itself, and not discovered in the opposite approach to the valley. This house, with its rough-cast walls, and deep wainscot-coloured wood-work, its over-hanging thatched roof and gables, and its rich carpet of lawn, forms a very pleasing object, though the elaborate cottage ornée style of the thing—which I afterwards found was built by John White, the nephew of the naturalist, and erst a Fleet Street bibliopole—has a pretension about it not quite in keeping perhaps with the perfect rurality of Selborne, and smacking too much of the spirit of cockneyism to harmonise thoroughly with the genius of the place.

"In other respects the village of Selborne has 'taken no note of time,' and remains so perfectly unchanged, that at the distance of forty years almost

every spot in it may be recognized from the descriptions of Gilbert White. His own house, the successive abode of several generations of his family, is of course the first object of the traveller's enquiry. It stands not very far from the church, on the opposite side of the road, and is an irregular unpretending edifice, which has evidently been enlarged at different periods with more care of interior comfort than of architectural symmetry. It is still inhabited, I was told, by a maiden relative of the naturalist, the last tenant of his family at Selborne, save those who sleep under its church-yard turf. The house, aided by the old-fashioned neatness of its lawns and gravel walks, preserves the staid aspect of by-gone days, and has apparently undergone no alteration since the death of the naturalist, It was impossible to gaze on the spot without recalling to memory those hundred little passages in his book which, with so pleasing and beautiful an association, have identified the intellectual pursuits of the man, and the tasteful purity of his mind with every beauty of his beloved retreat. The' Swallows, his favourite object of notice among the 'winged people,' were at the moment careering in circles round the house, and twittering among its eaves; and as with too intrusive curiosity, I could not help peering over the fence into the little garden, I thought of its quondam tenant, his old familiar friend and domiciled guest the tortoise, whose habits he has so quaintly described—of his oft-mentioned fruit-wall and vine—of his thick hedge rows, where a whole host of the feathery tribe were

repaid for the study which they afforded him with safe and hospitable entertainment—until amidst his favourite haunts, the form of the venerable naturalist himself almost rose up in fancy before me.

'In the centre of the village, and near the 'church,' still remains in its old condition the square 'piece of ground, surrounded by houses, and vul-'garly called the Plestor,' named originally as White elsewhere tells 'La Pleystow, locus ludorum, or play-'place.' The site of the ancient oak which stood in the centre of this spot until it was blown down 'in 'the amazing tempest of 1703,' is occupied by a huge spreading sycamore, now become almost as dignified as its predecessor; for it must have seen its centenary festival if the report of an old inhabitant be true, that it has undergone neither encrease of growth, nor other change, within forty years of his memory. Like the oak which it succeeded, it has a seat round its base, and a little thatched umbrella-shaped canopy round the trunk above; provided through the care of the same nephew of the naturalist who built the villa, both for shelter to the aged gossips, and protection to the tree from being injured by climbing urchins. In the church-yard, however, is a far older denizen of the village than this modern antique, the sycamore: an ancient yew, which I do not remember that White has noticed,* and mea-

* The tasteful traveller's memory is correct as to the omission of the mention of this tree in the Natural History, but it occurs in Letter V. of the Antiquities, of Selborne. 'In the 'church-yard of this village is a *yew-tree*, whose aspect be-

suring—for I had the curiosity to measure it, full 16 feet in girth. The church-yard is full of these frail memorials, which

'teach the rustic moralist to die.'

and might furnish some curious scraps for the amateurs of lapidary poesy. Among these quaint inscriptions is that, once the common legend of a thousand village tombstones, but now almost discarded, and grown too simple and hackneyed for the fastidious operatives of these lettered days—

'Afflictions sore long time he bore,
'Physicians were in vain,
'Till after all, God did him call,
'And eas'd him of his pain.'

So saith the record of Henry Bone; and beside him lieth in peace his wife Elizabeth, 'bone of his bone.' The grave of Gilbert White lies in undistinguished fellowship with those of the rude fathers of the hamlet, among whom he spent his benevolent and simple life. The tablet to his memory, which described the position of his remains as 'the fifth grave from the wall,' has been removed, by some pious care for its

'speaks it to be of a great age; it seems to have seen several 'centuries, and is probably coeval with the church, and *there-'fore may be deemed an antiquity:* the body is squat, short, 'and thick, and measures twenty-three feet in the girth, sup-'porting an head of suitable extent to its bulk. This is a male 'tree, which in the spring sheds clouds of dust, and fills the 'atmosphere around with its farina.'

preservation, from the exterior of the church into the chancel; and with this removal the site of the grave appears to have been forgotten; for, even the Parish-Clerk, who should be by his office the chronicler of the village, knew not the turf which covers the remains of the only man that hath honoured its name, and after catechising him on the original position of the tablet, it was only by some search that we verified the neglected spot, which I bade my guide hold in more reverential remembrance for the benefit of future pilgrims to the same lowly shrine.

"A slight heave of the turf 'the fifth from the 'wall,' with the initials and date,

'G, W. ob. 1793.'

on the low headstone, marks the humble grave of the naturalist and philosopher. In the little chancel of the church, the memorials of the Whites appear with some touches of more pretension, in epitaphs of fair rounded latinity. Among these, if I remember right, is the record of one who hath been written down '*Miles,*' and ended his days of disease, in the worst fate of his calling, far away from his native village, in the pestilential plains of St. Domingo. The altar-piece, a curious old picture, painted on wood, purports to be the gift of another member of the same family. The subject of the middle department is the Offering of the Magi; and the side panels, with a goodly disregard of the sin of anachronism, display bare-headed, kneeling friars and nuns telling their beads, with a cavalcade in the back-

ground attended by elephants, to mark, I ween, its travel from the east, and composed of worthies in Spanish hats and doublets, and steel-clad warriors in the panoply of the fifteenth or sixteenth century. The tablets to the memory of the naturalist and his brother, which have been removed from the exterior of the church, now stand on the south wall of the little chancel. The inscription on the former merely records his name and descent. He was the eldest son, as the short biographical notice prefixed to his works has told us, of John White, Esq., of Selborne, and Anne, the daughter of Thomas Holt, Rector of Streatham, in Surrey. But both his grandfathers were like himself, in the church: for what his biographer has omitted is here stated, that his paternal grandfather was vicar of Selborne. His brother and nephew were successively eminent booksellers in the metropolis. Both brothers have for the sum of their epitaph but a hackneyed quotation from Cicero—Gilbert,—'Nec bono quicquam mali evenire potest, 'nec vivo, nec mortuo.'—John,—'Ex hac Vita de-'cedimus tanquam ex hospitio non tanquam ex domo 'commorandi enim natura diversorium nobis non 'habitandi dedit.'

"In the absence of any great landed proprietors in the humble parish of Selborne, the Whites have evidently reigned for several generations the magnates of their native hamlet; and a memorial of their station of honour among the villagers remains to this day in a door of the chancel, which was pointed out as the separate entrance into the church

still reserved for the last resident of their name. It was unpleasing to hear, that since the death of the naturalist their fortunes had not risen. He bequeathed to them a comfortable property; but some agricultural speculations of his nephew, I was told, had ended ruinously, and involved in distresses an individual who seems to have been a man of spirit and enterprise, and to have had a laudable pride, with a disposition not uncongenial to that of the naturalist in ministering to the embellishments of his birth-place. Several little memorials of his regard for the recreations of the villagers yet remain to attest that his kindly feelings deserved a better fate. Of Gilbert White himself I could collect few personal reminiscences; and all that an old dame—who had nursed several of the family, and from whom these particulars of them were gleaned—could tell me of a philosophical old bachelor was, that 'he was a still quiet body,' and that 'there wasn't a bit of 'harm in him I'll assure ye, sir—there wasn't in- 'deed.' Alas! for all the dignity of science, and all the honour that befalleth a prophet in his own country!!"

Mr. White was fifty years Fellow of Oriel College, Oxford, and died at Selborne on the 26th of January, 1793, in the 73rd year of his age, having passed his life, as has been well said of him, with scarcely any other vicissitudes than those of the seasons.

I find the following pretty lines amongst his manuscripts. They are evidently not his own composi-

tion, but are somewhat descriptive of his favourite village, and will, I am sure, be read with interest. They are addressed to Mrs. J. White by her father, and are signed G. T.

From henceforth, my dear M—— I'll no longer complain
Of your ruts, and your rocks, of your roads, and your rain,
Here's a proverb that suits with your cottage most pat,
When a thing's of most worth, 'tis most hard to get at

And besides, where to find such another retreat,
As the shades of old Selborne, so lonely and sweet,
Where the lover so freely may languish and sigh,
Where the student may read, and the Christian may die?

But as now neither lover nor student am I,
(I'm a Christian I hope, but I wish not to die,)
So nor books, nor a mistress, nor zeal have inspired,
My muse to commend what she ne'er has admired.

Yet as mind gives a comfort to deserts and dens,
Makes a turnpike of bogs, and a garden of glens·
So affection, kind Chymist, I feel, can convert
To the sweetest of sweets what I thought to be dirt.

Be then welcome, dear Selborne, as welcome can be,
As the primrose of May, or the hawthorn to me;
For 'tis there (may they ever be blest from above!)
Dwell a daughter and son, and the children I love

'As soon as the good old lady comes in sight who has waited
'on it for more than thirty years, it hobbles towards its bene-
'factress with awkward alacrity, but remains inattentive to
'strangers. Thus the most abject reptile and torpid of beings
'distinguishes the hand that feeds it, and is touched with the
'feelings of gratitude.'—Nat. Hist. of Selborne.

Every admirer (and there are not a few) of Mr. White's Natural History of Selborne, must recollect the frequent mention he makes of his Tortoise. He very often took this animal to a neighbouring huckster's shop to be weighed; he sometimes immersed it in water, and tried various experiments upon it. On one occasion the Tortoise made its escape, and was missing for some time, but was afterwards found in an adjoining field, and brought back to the garden, where for many winters it had buried itself, and either enjoyed the sun under a south wall, or sheltered itself from the heat under the shade of a cabbage leaf. Mr. White has made every thing connected with his Tortoise interesting, and I am sure my readers will peruse with pleasure a supposititious letter of this celebrated animal to Miss Mulso, complaining of the treatment it had received from the curious naturalist. I found a copy of this letter among Mr. White's manuscripts in his own handwriting, and as it has not been published I now introduce it.

This Tortoise became the property of Mr. White at the death of an old lady at Lewes in Sussex. Mr. White called it 'Timothy,' and I find frequent mention made of it throughout his voluminous unpublished remarks now in my possession. Some of them ar as follow :—

'March 17. Brought away Mrs. Snooke's old 'Tortoise, Timothy, which she valued very much, 'and had treated kindly for near 40 years. When 'dug out of its hybernaculum, it resented the insult 'by hissing.'

'May 14. Timothy travelled about the gar-'den.'

'May 2. Timothy eats.'

'April 19. Timothy, who had withdrawn himself 'for several days, appears.'

'March 15. Timothy comes forth, and weighs 6lb. '5½ oz.'

'May 9. Timothy eats dandelion leaves and stalks. 'He swallows his food almost whole.'

'Sept. 19. Timothy forsakes the fruit wall, and 'retires to the laurel hedge, where he will lay him-'self up hereafter.'

'April 14. Timothy has become very alert, and 'marches about the walks.'

'Sept. 18. Timothy eats voraciously.'

'Dec. 8. Timothy has laid himself under the 'hedge against Benham's yard, in a very comfortable, 'snug manner. A thick tuft of grass shelters his 'back, and he will have the warmth of the winter 'sun.'

'Sept. 29. Timothy eats grass, token that the 'weather is warm.'

'June 4. Timothy took his usual ramble, and 'could not be confined within the limits of the gar-'den. His pursuits, which seem to be of the 'amorous kind, transport him beyond the bounds of 'his usual gravity at this season. He was missing 'for some days, but found at last near the upper 'malt-house.'

'Sept. 17. When we call loudly through the 'speaking-trumpet to Timothy, he does not seem to 'regard the noise.'

'June 20. We put Timothy into a tub of water 'and found that he sunk gradually, and walked on 'the bottom of the tub. He seemed quite out of 'his element, and was much dismayed. This species 'seems not at all amphibious. Timothy seems to be 'the 'Testudo Græca' of Linnæus. Dr. Chandler, 'who saw the operation, says, there is a species of 'tortoise in the Levant that at times frequents ponds 'and lakes; and my brother, John White, affirms 'the same of a sort in Andalusia.' (This seemed to have been added by Mr. White as an apology for the immersion of poor Timothy.)

'April 19. Timothy enlarges his breathing hole, 'and lifts up the earth.'

'April 21. Timothy heaves up the earth and puts 'out his head.'

'April 22. Timothy comes forth, and walks about.'

'May 2. Timothy marches about, and eats part of 'a piece of a cucumber paring.'

'Nov. 27. Timothy sleeps in the fruit-border
'under the wall, covered with a hen-coop in which
'is a good armful of straw. Here he will lie warm,
'secure, and dry. His back is partly covered with
'mould.'

Having made these selections from Mr. White's paper respecting the Tortoise, it is time that this celebrated animal should give the promised account of himself.

TIMOTHY the TORTOISE to MISS HECKY MULSO.

From the border under the fruit-wall, Aug. 31, 1784.

Most Respectable Lady,

Your letter gave me great satisfaction, being the first that ever I was honoured with. It is my wish to answer you in your own way, but I could never make a verse in my life, so you must be content with plain prose.

Having seen but little of this great world, conversed but little, and read less, I feel myself much at a loss how to entertain so intelligent a correspondent. Unless you will let me write about myself, my answer will be very short. Know, then, that I am an American, and was born in the year 1734, in the province of Virginia, in the midst of a Savanna that lay between a large tobacco-plantation and a creek of the sea.* Here I spent my youthful days

* There appears to be a curious mistake in Timothy's letter, for though he acknowledges that he lived a long while in the

among my relations with much satisfaction; and saw around me many venerable kinsmen who had attained to great ages, without any interruption from distempers. Longevity is so general among our species that a funeral is quite a rare occurrence. I can just remember the death of my great-great-grandfather, who departed this life in the 160th year of his age. Happy should I have been in the enjoyment of my native climate, and the society of my friends, had not a sea-boy, who was wandering about to see what he could pick up, surprised me, as I was sunning myself under a bank; and whipping me into his wallet, carried me aboard his ship. The circumstances of our voyage were not worthy a recital: I only remember that the rippling of the water against the sides of our vessel as we sailed along was a very lulling and composing sound, which served to sooth my slumbers as I lay in the hold. We had a short voyage and came to anchor on the coast of England, in the harbour of Chichester. In that city my kidnapper sold me for half a crown to a country gentleman who came up to attend an election. I was immediately packed in a hand basket, and carried slung by the servant's side to their place

country in which he was born, and calls himself an American, he was certainly in error as to locality. The shell of Mr. White's tortoise is still preserved by Miss White, one of his nieces, and a figure of it appears in the last edition of the History of Selborne, with Mr. Barnett's notes, and it proves to be a species that has only hitherto been found in Greece, and on the shores of the Mediterranean.

of abode. As they rode very hard for 40 miles, and as I had never been on horseback before, I found myself somewhat giddy with my airy jaunt. My purchaser who was a great humourist, after shewing me to some of his neighbours, and giving me the name of Timothy, took little further notice of me: so I fell under the care of his lady, a benevolent woman, whose humane attention extended to the meanest of her retainers. With this gentlewoman I remained almost 40 years, living in a little walled-in-court in the front of her house; and enjoying much quiet, and as much satisfaction as I could expect without society, which I often languished after. At last the good old lady died in a very advanced age, such as a tortoise would call a great age; and I then became the property of her nephew. This man, my present master, dug me out of my winter-retreat, and packing me in a deal-box, jumbled me 80 miles in post-chaises to my present place of abode. I was sore shaken by this expedition, which was the worst journey I ever experienced. In my present situation I enjoy many advantages such as the range of an extensive garden affording a variety of sun and shade, and abounding in lettuces, poppies, kidney-beans, and many other salubrious and delectable herbs and plants; and especially with a great choice of delicate gooseberries! But still at times I miss my good old mistress, whose grave and regular deportment suited best with my disposition. For you must know, that my master is what men call a *naturalist:* and much visited by people of that turn, who

often put him on whimsical experiments such as feeling my pulse, putting me in a tub of water to try if I can swim, &c.; and twice in the year I am carried to the grocers to be weighed, that it may be seen how much I am wasted during the months of my abstinence, and how much I gain by feasting in the summer. Upon these occasions I am placed in the scale upon my back where I sprawl about to the great diversion of the shopkeeper's children. These matters displease me; but there is another that much hurts my pride; I mean the *contempt shewn* for my *understanding,* which these *Lords* of the *creation* are very apt to discover, thinking that nobody knows any thing but themselves. I heard my master say that he expected that I should, some day tumble down the ha, ha, whereas I would have him to know that I can discern a precipice from plain ground as well as himself. Sometimes my master repeats, with much seeming triumph, the following lines, which occasion a loud laugh;

> 'Timotheus placed on high
> 'Amidst the tuneful quire
> 'With flying fingers touch'd the lyre.'

For my part I see no wit in the application, nor know whence the verses are quoted: perhaps from some prophet of his own, who, if he penned them for the sake of ridiculing Tortoises, bestowed his pains, I think, to poor purposes. These are some of my grievances, but they sit very light on me, in

comparison of what remains behind. Know then, tender-hearted lady, that my greatest misfortune, and what I have never divulged to any one before is—the want of society with my own kind. This reflection is always uppermost in my mind; but comes upon me with irresistible force every spring. It was in the month of May last that I was resolved to elope from my place of confinement; for my fancy had represented to me that, probably many agreeable Tortoises of both sexes might inhabit the heights of *Baker's Hill*, or the extensive plains of the neighbouring *meadow*, both of which I could discern from the terrass. One sunny morning I watched my opportunity, found the wicket open, eluded the vigilance of the gardener. and escaped into the saint-foin, which began to be in bloom, and thence to the beans. I was missing eight days, wandering in this wilderness of sweets, and exploring the meadow at times. But my pains were all to no purpose; I could find no society, such as I sought for. I began to grow hungry, and to wish myself at home: I therefore came forth in sight, and surrendered myself up to Thomas, who had been inconsolable in my absence. Thus, Madam, have I given you a faithful account of my satisfactions and sorrows, the latter of which are mostly uppermost. You are a lady, I understand, of much sensibility. Let me therefore make my case your own in the following manner; and then you will judge of my feelings. Suppose you were to be kidnapped away *to-morrow* in the bloom of your life, to a land of Tortoises; and were never to see again a

human face for fifty years!!! Think on this, dear lady, and pity

Your sorrowful reptile,
Timothy.

While on the subject of Tortoises, I may mention that Captain Gooch, one of the elder brethren of the Trinity House, informed me that when he was at Calcutta, he was told that a Tortoise which had belonged to and been a great favourite of Lord Clive, when he was Governor General of India, was still alive. He went to see it, and as no one seemed to take any interest in it, he procured it with little difficulty, and brought it to England. Before he left Calcutta, he made every enquiry in his power as to the probable age of this Tortoise, and ascertained from a variety of corroborative circumstances, that it could not be less than two hundred years old. On its arrival in England, it was put into the coach-house at Captain Gooch's house on Clapham Common, where it did well for a short time, but one morning nothing of it was found but its shell, the poor Tortoise having been devoured by rats.

> With *White* my spirit finds beloved employ:
> A sage who cared not how the world would prize
> His sylvan strolls, so nought might him annoy,
> Roaming through Selborne's woods, in loneliness and joy.
>
> ANON.

In looking over Mr. White's Manuscripts,* I find the following pleasing notices of the seasons, and can only regret that they conclude so abruptly. They will, I think, be read with interest.

January.

'To this month our Saxon ancestors gave the sig-'nificant name of Wolf-month, because the severity 'of this season usually brought down the wolves 'from the woods and mountains among the villages 'and enclosures, where they committed frequent ra-'vages. Hence we may infer that the tenour of our 'weather was the same twelve centuries ago; for now 'if we have any heavy frosts, they usually befall in 'January. If this month is not rigorous, it is either 'obscured with deep fogs or drowned with rains, so 'that it may fairly be said to be the most uncom-'fortable in the whole year.

'Yet there are pleasing circumstances which some-'times occur; such as the wild song of the missel 'thrush occasionally ushering in the year. This is

* In the possession of Mr. Murray of Albemarle Street.

'our most early woodland songster, which sitting in 'the top of some tall tree in showery weather, exerts 'his throat in loud uninterrupted strains, and is called 'by our country people the Storm Cock. In this 'month also, the wren sings very melodiously, and 'availing himself of the food and shelter that he de-'rives from stables and outhouses, appears wonder-'fully alert and vigorous.

'As to insects, they by no means lie all benumbed 'through the winter; for even in this month house 'crickets, spiders, wood-lice, and the nimble shining 'creatures that frequent sugar cupboards, are stir-'ring and abroad; gnats (empedes et tipulæ) are 'seen frisking whenever a mild day encourages them; 'nor are earth-worms afraid to extend themselves on 'the turf in warm and foggy nights. This gloomy 'month is not altogether without flowers; though 'vegetation seems to be asleep, for now the Helle-'borus fœtidus, and various mosses blossom in our 'woods; and fructification goes on in the instance of 'ivy berries, which continue to swell whenever the 'weather will give them the least respite.

February.

'This month may well be called the dawn of 'Spring, because within its course vegetation visibly 'begins to revive. Under this idea the Saxons 'named it Sprout Cale, from observing that their 'cale or cabbage (such as it was) began to make 'shoots. Not that this month is exempt from severe 'weather; for the frosts of January often extend into

'it; but yet such is the influence of the approaching 'sun, that they seldom maintain their rigour for any 'time. A February is hardly known without a fine, 'soft, still season, attended by a high barometer, and 'a heavy, thick, dark sky, lasting often for several 'weeks without either sun or rain, during which the 'lover of a garden has an opportunity of adjusting 'his beds and borders, to examine each budding root, 'and to transplant such flowers as want removing. 'In this infancy of the year incidents are rare; and 'therefore the commonest occurrences must not be 'passed over. Now the marsh titmouse exerts his 'two harsh quaint notes, which some compare to the 'whetting of a saw; and the great black-headed 'titmouse distinguishes himself by three cheerful 'notes. The hedge-sparrow, yellow hammer, and 'chaffinch, also essay to sing, and accompanied 'sometimes by the wood, and sky lark, and the song 'thrush. Ravens pair and build, a hardy race, that 'live as it were by accident, being supported by the 'casual deaths of maimed or distempered cattle. 'Crocuses blow and call forth the bees which will 'discover them though partly covered with snow. 'Now the helleborus vindis emerges, and expands 'its blossoms as soon as it gets clear of the ground; 'the male yew tree sheds its farina or impregnating 'dust, and hazels open their scarlet flower and cat- 'kins. At times this month is very wet and floody, 'hence the country man calls it February fill dike. 'Proverbs or adages respecting weather, though ever 'so homely, are worthy the attention of the natu-

'ralist, because founded on good sense and obser-
'vation.

March.

'Nothing can be more changeable than this month,
'some say its characteristic is fickleness, it storms,
'it smiles, it snows, it hails, it shines, it rains, all in
'a day. Yet if it has any prevailing and predomi-
'nate feature that may uniformly distinguish this
'various period, it is that of the harsh north-east
'winds, which always prevail sooner or later in some
'part or other.

'The Saxons called this the lengthening month,
'because about the vernal equinox, for reasons of
'which they were not aware, the days encrease in a
very rapid manner. This month is distinguished
for producing the first summer bird of passage, the
smallest uncrested wren, which though so minute,
exerts his two sharp notes with such earnestness,
as to make the woods echo, and is usually heard
about the 20th day.

'Around pools and mill ponds some few swallows
are usually seen before the month closes. The va-
rious tribes of flies awake and come forth; the yel-
low butterfly in particular amuses the naturalist;
while warmed by the prevailing sun, the reptiles
forsake their winter retreats. The same encreasing
warmth that calls our summer tribes into life, warns
the winter birds to retire. The woodcocks which
usually visit us in a spring flight, now pair and
withdraw. The field-fares cluster on trees, and es-
say to sing before they take their departure, while

'our home-bred flocking birds, the larks, the chaf-
'finches, the yellow hammer, and the linnets, begin
'to separate and dissolve their winter associations.
'Towards the end of this month, the orchards and
'meadows glow with the golden blossoms of the
'Ficaria verna, the pile wort or less celandine; the
'whole face of the ground seems to be covered with
this plant, yet in a few weeks it is gone, leaves and
'all, to make way for succeeding tribes; so that no
'vestiges remain. In England, a dry March is
'justly esteemed kindly for wheat, and a peck of
'March dust (according to the proverb) is inesti-
'mable.

'As the month advances, the sun mounts very
'high, and has much influence. Yet the piercing
'winds still prevail, so that it is often summer on
'one side of the hedge, and winter on the other. Of
'these contrarieties, the invalid complains, and the
'country man repines that the springing of his grass
'and corn is retarded. Yet from these extremes,
'reconciled and moderated by the hand of Provi-
'dence, much good results. Thus sings the poet of
'nature whose philosophic reflexions and moral re-
'marks are only to be equalled by his own matchless
'descriptions.'

'Be patient swains, these cruel seeming winds
'Blow not in vain; for hence they keep repressed
'Those deepening clouds on clouds surcharged with rain,
'That o'er the vast Atlantic hither borne
'In endless rain, would quench the summer blaze,
'And cheerless drown the crude, unripen'd year.'

April.

'The engaging month of April is distinguished 'by the arrival of most of the summer-birds. The 'swallow, the bank-martin, the house martin, the 'cuckoo, the nightingale, the black cap, the white 'throat, the second and third uncrested wren, the 'redstart, the grasshopper-lark, and the swift, steal 'into sight and crowd ———'

'Hail old patrician trees! so great and good!
'Hail ye plebeian underwood,
'Where the poetic birds rejoice
'And for their quiet nests and plenteous food
'Pay with their grateful voice.'

COWLEY.

WHEN I see a beautiful and magnificent tree flourishing in a verdant meadow and partaking of the moisture from some neighbouring stream—with cattle enjoying the protection of its shade, and birds sporting amongst its branches, I have in an instant a delightful picture presented to my mind's eye. It puts me in mind of the emblem of a good man.—'He 'shall be like a tree planted by the rivers of water, 'that bringeth forth his fruit in his season; his leaf 'shall not wither.' He will indeed hereafter 'flou'rish in immortal youth, and bloom for ever in un'fading beauty.'

It is from reflections of this sort that I am the more able to appreciate the charms of a country life, and enjoy the various little scenes and objects which are constantly presenting themselves to my view. From some one or other of them the highest feelings of devotion towards God, and consequently of kindness towards our fellow-creatures, may be awakened; some lesson may be learnt, or some information derived, to be added to our store of remarks on Natural

History, and increase our admiration of the ways of Providence in the economy of Nature—

> 'Thus my life, exempt from public haunt,
> 'Finds tongues in trees, books in the running brooks,
> 'Sermons in stones, and good in every thing.'

Nature indeed is a great economist, and I perceive this to be the case every day more and more. The farina of flowers—the decay of a leaf—the dead bark of a tree—all in their turn answer some useful purpose. A piece of rush which sinks to the bottom of a river becomes the abode of an insect, and the deserted web of a spider forms part of the building materials of some of our pretty songsters. I have elsewhere remarked that when cattle are cooling themselves in the water, the flies they whisk off with their tails become the food of numerous small fish which surround them; indeed, when the former are grazing, they are frequently followed by water wagtails, who procure their food by the same means. The fern owl and the bat prevent too great an increase of nocturnal insects. Though the latter have no apparent enemies to contend with, they are not permitted to become so numerous as to be an annoyance to man. Mice which conceal themselves in the day time and seek their food at night, are also kept within due limits by the owl, whose soft feathers and silent motions enable it to approach its prey without creating any alarm.

It is difficult to ascertain the wiles and stratagems which wild or savage animals have of securing their

prey; but it is probable that if we could be acquainted with them, they would evince no small degree of sagacity and forethought. We know that this is the case with the fox and the wolf, and the following instance will shew that the dog sometimes shews the cunning of the race to which he belongs.

My neighbour, Mr. S., during the time he resided in Ireland, had a large flock of valuable sheep. Two of them having been killed by dogs, he set several men to watch the sheep at night, and as long as they continued to do so, not a sheep was missing. The very night however on which the men were withdrawn, ten of the sheep were killed, and one dog was caught in the act of worrying a sheep in a ditch, and another was seen to make its escape. The captured dog was marked with paints, and had a small log fastened to him, and was then turned loose, in order that his owner might be discovered. As long as the dog was watched, he lay down, and refused to move, but now and then lifted up his head, and looked about him. Finding this to be the case, Mr. S. stationed men on horseback at different places, and went himself to the top of his house to give a signal of the quarter to which the dog might make. Finding no one in sight, he at last made off, and was traced to a house two miles distant. The other dog was also discovered in the same neighbourhood, and his owner confessed that he had seen him return, go into a pond to wash himself, and in which he shook his head backwards and forwards, evidently for the purpose of washing something from his mouth. He afterwards

rolled on some straw, and then hid himself amongst the straw in a barn, from whence he did not come until he was dry. Both the dogs were shot. It appeared that they must have passed their master's, and a flock of sheep belonging to another farmer, which they never touched, before they began their depredations on Mr. S.'s flock, thus evincing a degree of cunning and almost reflection of no common kind.

I may add the following fact as a confirmation of this sagacity in the dog. Mr. Knight, the principal landed proprietor at Isleham, in Suffolk, preserved the game on the manor of which he was lord. One day he saw a man, with his dog, hunting in the open field for game; who, as soon as he saw him, made off, being at a considerable distance when he was first discovered, and Mr. Knight found it would be useless to pursue him. He heard, however, a shrill whistle, and immediately saw the dog fall down. He rode up to him, and found him apparently dead, being stretched out at length, his eyes closed, and, to all appearance, breathless. Mr. Knight whipped the dog severely, and endeavoured to make his horse tread upon him, but all to no purpose. The animal was immoveable, and seemed to be quite inanimate. Mr. Knight therefore left him, half persuaded that he was dead. He kept his eye, however, upon the spot, and when he had got to a considerable distance, he saw the dog rise, look cautiously about him, and, when he found the coast clear, he set off *full speed* after his master.

The attention which a beneficent Providence has shewn to the wellbeing of its creatures is beautifully illustrated by the following fact. When a bird *sits* on its perch at roost, the action of doing so, from the peculiar formation of the muscles of the legs and thighs, draws the claws of the feet together, so that they hold tightly to the perch as long as the bird is in a sitting posture. But for this circumstance, the comfort and security of the bird would be endangered by every gale of wind while it reposed.

I have observed that very young fish keep almost entirely in shallow water. If it were not for this precaution they would soon fall an easy prey to those of a larger size. As long, however, as the fry keep in shoal water, they cannot readily be got at. As they increase in size and strength they go into deeper water, and are then better able to protect themselves. I like to see them dart away as I approach their haunts, and stop as soon as they imagine themselves to be out of danger.

'See the light tenants of the barren air.
'To them, nor stores, nor granaries belong,
'Nought, but the woodland, and the pleasing song;
'Yet, your kind heavenly Father bends his eye
'On the least wing that flits along the sky.
'To him they sing, when spring renews the plain,
'To him they cry in winter's pinching rain;
'Nor is their music, nor their plaint in vain.' THOMSON.

In the preceding pages I have mentioned some well authenticated anecdotes of dogs, and they must, I think, assist in proving that the faculties of that animal are superior to what is generally supposed. He seems to have been the only creature in which the 'fear and dread of man' has not been implanted. In fact, in all our vicissitudes of misery; in sickness, in poverty, in distress, and even in death; forsaken by friends, frowned upon by the world, and wandering an outcast over the face of the earth, this poor animal clings to us through all. His sense is almost equal to his fidelity, and he possesses qualities to which many, in a state of degradation, can have no pretension.

My object in making the above remark, was to shew how much we are bound to treat not only dogs, but every animal with tenderness and kindness. This feeling is strongly enforced upon us by our benevolent Creator, who not only inculcates, but commands

us to shew mercy. 'If thou see the ass of him that 'hateth thee lying under his burthen, and wouldest 'forbear to help him, thou shalt surely help him.' A special law was prescribed in favour of the oxen which trod out the corn; and numerous instances might be brought forward to shew that all created things are objects of the Divine care and compassion.

Nothing is more detestable than cruelty, and it is a sad reflection that the chief miseries of animals are inflicted upon them by man. Some persons can find sport in witnessing pain and distress, and will destroy life out of mere wantonness. But for this cruelty, we might have the gratification of being surrounded by animals in a state of comparative happiness, showing their gratitude for the kindness of man, by losing all *

We shall probably be always in a state of uncertainty as to the degree of happiness animals are capable of enjoying. Those extraordinary faculties which they possess, and which are so nearly allied to reason, may, for aught we know, make them more susceptible to the impressions of pleasure and pain. Mr. Locke says that if animals have any ideas at all, and are not mere machines, as some would have them, we cannot deny them to have reason. It seems to me, he adds, as evident that they do in some instances reason, as that they have sense. If this is the case (and I shall bring forward some evidence of the fact) we ought to entertain more kindly

* A proof of this may now be seen at Walton Hall, the seat of C. Waterton, Esq.

feelings towards them than we generally do. Their fondness for their offspring is as fervent, and their love and affection are, in many instances, as strong as our own. They are susceptible of gratitude, and of the strongest attachments. They are honest, patient, and forgetful of injuries—brave and courageous amidst dangers, and afford examples of perseverance and industry in providing for the food and safety of themselves, and their young, equal to the most rational foresight. Those, who like myself, have not only watched, but studied the character and habits of animals, will agree in what has been said of them. I will proceed to illustrate it by some examples. I wish, however, to remark that in relating anecdotes of animals, I lay myself open to the charge of going beyond the bounds of probability. I do not think, however, that this is a sufficient reason for withholding them, whilst I have myself a conviction of their accuracy. It is perhaps, in many cases, difficult to assert the truth of a fact when it militates against generally received opinions, without incurring the charge of exaggeration. If this feeling was allowed to operate, much curious information would be suppressed. I shall therefore state such facts as have been well authenticated, assuring my readers that I have not communicated an anecdote, of the accuracy of which I entertained the least doubt.

It is well known that gregarious birds place a sentinel on some high tree to watch and give the alarm when danger is apprehended. This is the case with the marmot tribe which live in *villages*, as the Ame-

ricans call them. Dr. Richardson, in his interesting work, the American Fauna, states that the whistler marmot (arctomys pruinosus) burrows in sandy soils, generally on the sides of grassy hills, and may be seen cutting hay in the autumn, either for food, or for lining its burrows. While a party of them are thus occupied, they have a sentinel on the look-out, upon an eminence, who gives the alarm on the approach of an enemy by a shrill whistle, which may be heard at a great distance. This signal of alarm is repeated from one to another, as far as their habitations extend. Parry's marmots (arctomys Parryi) do the same, and also the wood-chucks (A. monax). These are particularly fond of red-clover, and often prove injurious to the farmer, by the extent of their depredations. They sally forth in a body on their marauding excursions, generally at mid-day, and having placed sentinels, proceed to fill their mouths. On the approach of danger, the sentinels give the alarm, and they betake themselves to their burrows with the utmost speed. These animals, therefore, must have some understanding, to enable them to know, and express their wants to those who are placed to watch over their safety. They must have a language, or something equivalent to it, by which to demand and give mutual assistance. The whole history of the beaver affords another proof of this. In cutting down a tree, it gnaws it all round, cutting it, however, somewhat higher on the one side than the other, by which the direction of its fall is determined. It will cut through a tree ten inches in dia-

meter.* The beavers that build their houses in small rivers or creeks, in which water is liable to be drained off when the back supplies are dried up by the frost, are wonderfully taught by instinct to provide against that evil, by making a dam quite across the river.† They appear to be gifted with a natural arithmetic which enables them to proportion their habitations and provisions to the wants of the community. They assist each other, and appear to have a language by which they communicate their wants. Hearne's account of them is extremely interesting.

In order to prove that the faculties of animals of the same breed vary, and that some are more gifted with peculiar properties than others, I will mention the following circumstance. In a litter of pointer puppies, I have known one which pointed and backed the first time it was shown game, while others of the same litter required great trouble in breaking.

A dog which has been left in a room by himself, has been known, either from hunger, or a wish to get out, to ring the bell. This he has done, not in one or two instances, but in several. This appears a strong proof of reflection.

Both dogs, cats, and sheep have been known to come to man for help when their young were in danger, and they were unable to assist them themselves. Many animals and insects will put on a semblance of death, a proof that they think by doing so they shall avoid the threatened danger. The land-rail will do this.

* Dr. Richardson. † Hearne.

Some of the woodpecker tribe, in excavating a hole in a tree for the purpose of incubation, will carry away the chips to a distance in order that they may not lead to a discovery of their nest. Many birds remove the excrement of their young for the same reason. Quails have such a perfect knowledge of the approach of the autumnal equinox, that the day of their arrival in Malta is marked on the almanacks of the Island about the 22d of September, and varies every year with the equinox.

Both wolves and foxes have been known to place themselves in ambush, while others of their species have driven their prey towards them for the purpose of its being more readily taken.

I have seen a dog, and have heard of a cat, who, by significant gesticulations, made the family aware that the house was in danger of being set on fire.

The fact of swallows coming in a body to close up the hole of one of their nests, when a sparrow had taken possession of it, is undoubted. Here is an instance not only of the power of forming a plan, and of a communication of ideas, but of an excitement to revenge, which might be thought exclusively human. This feeling of revenge was, however, in an instance which I witnessed myself, and have already recorded, carried still farther. The swallows waited till the young of some sparrows which had taken possession of their nest were hatched, when they came with several of their congeners, and pecked the nest to pieces, and the young were killed in consequence.

A few years ago, the Rev. Mr. North, the Rector of Ashdon, in Essex, placed a pot of honey in a closet, where there was plaster rubbish, it having been recently built. After some months, he went to the closet for the honey, and was struck with the appearance of a mound of rubbish against the side of the pot, and nearly to the top of it. He delayed removing it, till he had considered what could have occasioned it, the closet having been locked. On setting a trap, he caught a mouse, which proved to be the culprit. Upon examining the honey, the pot was nearly full, the honey having been raised to the top of the vessel by means of throwing in rubbish of the same material as the mound, and with which it was nearly half filled. In relating this anecdote, I have mentioned the name of the clergyman and his place of residence in order to avoid an appearance of deception. He is now dead, but the fact is known to many persons, one of whom communicated it to me. It affords, I think, a strong proof of the reasoning faculties of animals.

I have had frequent opportunities of conversing with gentlemen who have resided many years in the East Indies, and who have related anecdotes of the elephant. All these tend to prove, that besides strong feelings of resentment for injuries, and gratitude for kindness, they are possessed with intellectual powers, if I may call them so, which are quite extraordinary. The following fact is a proof of this. It was communicated to me by a gentleman who resided many years in the East Indies. An elephant

had been cruelly used by its keeper, and to so great a degree, that the man was afraid of coming near it. In order to avoid its resentment, the man slept in some straw, just outside of the reach of its chain. The elephant was one night littered down with the stalks of the sugar-cane, and it took the opportunity of twisting one of the ends of the cane into the hair of the mohaut while he was asleep, and thus having drawn him within his reach, he crushed him to death.

Mr. Locke's account of Prince Maurice's Parrot, which not only answered questions, but reasoned, and (if the account is correct) might be considered a rational bird, would alone be sufficient for my argument. Enough, however, has been said to prove that animals are endowed with a sense beyond mere instinct, and with faculties amounting almost, if not quite, to reason. That infinite Power which formed them will no doubt dispose of them in a way equally wise and benevolent, showing perhaps thereby that the very miseries animals have been allowed to undergo in this world are somehow or other made up to them, in a way which will hereafter prove the goodness, as well as the justice, of their Creator. Our very ignorance of the ways of Providence tempts us to place limits to its operations, and to treat every deviation from what we are accustomed to consider probable, as absurd or ridiculous.

> 'Valet ima summis
> 'Mutare, et insignem attenuat Deus,
> 'Obscura promens.'

'Nature its mother, habit is its nurse.' POPE.

MANY animals shew an extraordinary attachment for the place where they were born, or where they have been associating with other animals of the same species for some length of time, One should hardly have expected to have found this attachment to a particular spot in fish. Fish, however, which have been taken from one situation in a river, and put into the same river many miles distance, having been previously marked, have returned, and been again caught in the same spot from which they had been originally taken. A lady who lived in Glamorganshire, on quitting her house for another residence, removed some favourite pea-fowls; they were placed in baskets, conveyed a distance of nearly sixty miles to her new abode, and then turned loose. The day after their arrival they all flew back to their old haunts, which they appear to have had no difficulty in finding, as they were soon afterwards seen there. This is not only a strong proof of their local attachment, but shews the peculiar faculty which enables animals to find their way back to places from which they have been taken, through regions which they have never before traversed. Pea-fowl are not much given, either to range far, or to fly any long distance, and this makes the fact which has been mentioned still more extraordinary.

One, however, still more surprizing recently occurred. A farmer residing on the borders of the New Forest, in Hampshire, went over to the Isle of Wight, and there purchased a mare from a person of his acquaintance near Newport. The mare was put into a passage-boat, conveyed to the Hampshire coast, and, when landed, was taken to the purchaser's residence, and afterwards turned into one of his fields. The next morning the mare was missing; search was made for her, but she could neither be found or heard of, and it was supposed she had been stolen. The farmer soon afterwards had occasion to go again to the Isle of Wight, and on mentioning his loss to the person from whom he had purchased the mare, he was informed that she had safely returned to the premises of her former master. The nearest distance from the Hampshire coast to the Isle of Wight is five miles, although the mare probably had to swim a much greater distance.

It is certain that horses have the power of swimming many miles, of which the following fact is a proof. A gentleman, while bathing under the rocks, which are close to the sea, near Dunraven castle, in Glamorganshire, saw some strange object at a considerable distance swimming towards him: as this object came nearer, it made a great snorting, and proved to be a horse. The opposite coast was ten or twelve miles from the spot, and it was never ascertained to whom the horse belonged, or from whence he came. He was much exhausted when he landed, and was taken to Dunraven castle, the owner of

which took care of him for many years. It is more than probable that the horse was endeavouring to return to his former quarters in South Wales.

Animals not only sometimes shew their dislike of being taken from their old quarters, but evince much impatience on finding themselves with new masters. A friend of mine, who went with the French army to attack Algiers, informed me that when the troops got possession of the place, they found a number of camels in the town, which were used to convey the baggage, &c. These animals shewed considerable uneasiness and dislike at the unusual manner in which they were handled, treated and spoken to by their new masters. One of them, which was loaded with the canteen and other effects of one of the French generals, trotted off, and joined some Arabs who were hovering at a distance, waiting for an opportunity of attacking the French troops.

The following is a curious instance of the force of habit. A cow, which had been a long time on board a ship, was, on her arrival at Portsmouth lately, and turned into a pasture-field, where it would have been thought she would have enjoyed herself greatly: she, however, became very restless, refused to eat, and made her way to the shore, where she bellowed so loud and incessantly, that a boat was sent for her, and she was taken on board again.

A cow had been sent to grass to a place twenty-one miles distant from her owner's residence: she remained there very contentedly during the summer months, while the pasture was good, but in October, when

the grass began to be scarce, she returned to her former feeding ground.

A gentleman residing at Caversham bought two pigs at Reading market, which were conveyed to his house in a sack, and turned into his yard, which lies on the banks of the river Thames. The next morning the pigs were missing; a hue and cry was immediately raised, and towards the afternoon a person gave information that two pigs had been seen swimming across the river at nearly its broadest part. They were afterwards observed trotting along the Pangbourn road; and in one place, where the road branches off, putting their noses together, as if in deep consultation; the result was their safe return to the place from which they were originally conveyed to Reading, a distance of nine miles, and by cross roads. The farmer from whom they had been purchased, brought them back to their owner, but they took the very first opportunity to escape, recrossed the water like two dogs, (thus removing the stigma on their race, which proverbially disqualifies them for swimming without cutting their own throats) and never stopped until they found themselves at their first home.

In this instance we see difficulties overcome, and an element encountered, to which the animals could not have been accustomed, in order to arrive at a far distant place to which they were attached. It is evident that the recollection of that place, and of their early associates, influenced the proceedings of the animals; but that they should be in possession of

a faculty which induced them to swim a river, and led them in an almost direct line to their distant home, is not a little to be wondered at. The instances of this faculty are too numerous to leave any doubt on the subject, and neither time nor distance appears to impair it; the following curious fact will prove this, and I only regret that I do not feel at liberty to mention the name of the lady to whom I am indebted for this and other interesting anecdotes.

A lady residing in Glasgow had a handsome cat sent to her from Edinburgh; it was conveyed to her in a close basket and in a carriage. She was carefully watched for two months, but having produced a pair of young ones at the end of that time, she was left to her own discretion, which she very soon employed in disappearing with both her kittens. The lady at Glasgow wrote to her friend at Edinburgh deploring her loss, and the cat was supposed to have formed some new attachment, with as little reflection as men and women sometimes do. About a fortnight, however, after her disappearance at Glasgow, her well-known *mew* was heard at the street door of her old mistress, and there she was with both her kittens; they in the best state, but she very thin. It is clear that she could only carry one kitten at a time. The distance from Glasgow to Edinburgh is forty miles, so that if she brought one kitten part of the way, and then went back for the other, and thus conveyed them alternately, she must have travelled one hundred and twenty miles at least. Her prudence must likewise have suggested the necessity of

journeying in the night, with many other precautions for the safety of her young.

Extraordinary as this anecdote may appear, its accuracy need not be doubted, and it offers another proof of those infinite degrees of perceptions which may be observed in animals, and which are not a little wonderful, as affording a *glimpse* certainly of what we have yet to learn respecting them.

'The lone Fern-Owl flaps his heavy way
'To his dark home, scared at th' approach of day.'

From the 'Ruined Church'
An unpublished poem of the late Rev. C. Wolfe.

The fern-owl (caprimulgus) is the only bird that I am aware of, which is at the same time migratory as well as nocturnal. If there is an exception, it is, I think, in the horned owl (strix otus) which is now supposed by many persons to migrate. It appears on the coast of Suffolk, in considerable numbers, about the time woodcocks first arrive. The fern-owl is very impatient of the glare of sunshine; it does not leave its dark retreat till the sun has set, and retires to rest as soon as it rises; it is admirably formed for the purpose of taking insects, from the wideness of its mouth, the stiff vitrissæ at the corner of it, and the serrated nail of the middle toe. Mr. White says that he had a fair opportunity of contem plating the motions of this bird, and what pleased him most was, that he saw it distinctly, more than once, put out its short leg while on the wing, and, by a bend of the head, deliver somewhat into its mouth. He adds, that if it takes any part of its prey with its foot, as he has now the greatest reason to suppose it does, he no longer wonders at the use of its middle toe, which is curiously furnished with a serrated claw.

The fern-owl is very foolishly supposed by country people to suck goats; hence their name of goat-sucker; and to inflict a disease on calves. This disease is called by farmers 'the puckeridge,' and the bird is known in some places by that appellation. They remain with us about four months, and begin to lay the beginning of July; they make no nest, but lay two oblong eggs beautifully spotted, under a bush, and hatch their young about the sixteenth of that month; they have but one brood, making this country a place for breeding only. These birds generally arrive with us the first or second week in May, provided the evenings are soft and warm, and continue their *jarring* note for a long space together, without seeming to draw their breath. As this song is a summer incident, the naturalist hears the first return of it with complacency; not from its melody, for it has none, but from the pleasing association of summer ideas raised in the minds of every lover of nature. It comes nearer to the jarr of the mole cricket (gryllus gryllotalpa) and has been taken for it. Some have likened the note of this bird to castanets. Like the still note of the quail, and the 'sibilous whisper,' as Mr. White calls it, of the grass-hopper lark, though not loud, yet it is heard at a distance These birds frequent the same spots, and delight in coverts like the woodcock. I recollect on disturbing two of them from their dark and shady retreat, they appeared to stare about with great astonishment at the glare of light, and allowed me to come close to them as they sat on the trunk of

a fallen tree. Nature has provided a plentiful supply of food for them. At their first appearing, they fare deliciously on the cock-chaffer, which then comes out of the ground; and all July they feast on the fern-chaffer, which flies during the course of that month; nor have they any competitors in their nightly excursions except the bats, with whom they contend in swiftness for the scarabæi and phalænæ of the evening. Their wings and tail are very long, by means of which they excel in swiftness and sudden evolutions, and mount instantaneously from a level flight, like a sky-rocket. They have a parading way sometimes, flying round their observers, and hanging in the air, during which manœuvres they make their long pliant wings clash over their backs with a loud snap, in the manner, as Mr. White observes, the pigeons called smiters are known to do. Whether this gesture is matter of exultation or menace does not appear.

Instead of being noxious and mischievous, they are the most harmless and useful of birds, destroying the great enemies of vegetation, the scarabæi and phalænæ, which, though individually feeble, yet are of mighty efficacy in their infinite numbers, inflicting on the grass and corn amazing devastations, and stripping whole groves, woods, and extensive forests of their foliage at once, so as to make them look as naked as in winter. Fern-owls love to frequent oaks, because those trees harbour their favourite food.

When flushed in sunshine, they drop again at

once, so as to be in danger of being caught by spaniels; hence the notion of their being foolish birds. They sit on a bare bough when they churr, but I have seen a cock-bird that was very loud on the wing, attended by his hen and two young.

An old farmer told me that when returning home late of an evening, he has been sometimes so boldly attacked by the fern-owl, that he has been in some degree of fear, deeming it, as many do, venomous; no known bird is so. Thus, impelled by the feeling of natural affection, feeble as it may appear, does this bird repel and intimidate intruders, and by menaces, defends to the best of its power, its callow and helpless young. The Poet of Nature, as he may be justly called, elegantly remarks, that natural affection inspires the most timid of the feathered race with courage, and the most simple with artifice.

> ' Hence around the head
> ' Of wandering swain the white wing'd plover wheels
> ' Her sounding flight, and then directly on
> ' In long excursion skims the level lawn,
> ' To tempt him from her nest: the wild duck, hence,
> ' O'er the rough moss, and o'er the tractless waste
> ' The heath-hen flutters, pious fraud! to lead
> ' The hot-pursuing spaniel far astray.'
>
> THOMSON'S SEASONS.

The caprimulgus is known in different parts of England by the names of the dor-hawk, fern-owl, night-hawk, jarr-owl, churn-owl, wheel bird, puckeridge, and night-jarr.

This bird is perhaps one of the most beautiful

which appears amongst us; its plumage is varied with white, black, brown, and a ferrugineous brown, with numerous transverse lines, and the whole so diversified, 'so beautifully freckled and powdered 'with browns of various hues,' as almost to bid defiance to an accurate description.

The night-jarr is found most frequently in solitary and uncultivated places; at least it is in such situations that I have most generally met with it; they are, however, very numerous in the beautiful domain of Bearwood, in Berkshire.

'Shall little haughty ignorance pronounce
'*His* works unwise, of which the smallest part
'Exceeds the narrow vision of her mind?' THOMSON.

WHEN I see a magnificent old tree standing beside a clear, broad, and unruffled river, I can fancy that it delights in contemplating its own grandeur in the watery mirror. The space which intervenes between the tree and the river is generally covered in spring with a great variety of flowers, as if nature's liberal hand delighted in decking the giant's favourite spot with garlands of every hue. Unlike the cypress—

'A gloomy tree, which looks as if it mourn'd
'O'er what it shadows,'

the sight of a fine oak always gives me the idea of something grand and majestic, and it seems to impart a kindly influence to everything around it. The economy of trees, plants, and vegetables, is a curious subject of enquiry, and in all of them we may trace the hand of a beneficent Creator; the same care which he has bestowed on his creatures, is extended to plants; this is remarkably the case with respect to hollies: the edges of the leaves are provided with strong, sharp spines, as high up as they are within the reach of cattle; above that height, the leaves are generally smooth, the protecting spines being no

longer necessary. Mr. Southey has noticed this circumstance in the following pretty lines:—

'O reader! hast thou ever stood to see
'The holly tree?
'The eye that contemplates it well perceives
'Its glossy leaves;
'Order'd by an Intelligence so wise
'As might confound an Atheist's sophistries.

'Below a circling fence, its leaves are seen
'Wrinkled and keen;
'No grazing cattle through their prickly round
'Can reach to wound;
'But, as they grow where nothing is to fear,
'Smooth and unarm'd the pointless leaves appear.'

I was lately shewn a plant which puts out a pretty, modest flower, from the lower part of the stem. When its blossom is over, the stalk on which it grew turns down to the ground, the end penetrates the earth, and there throws out and ripens its seed-pod; but for this propensity of the plant, the seeds would probably be destroyed by birds and insects. Some plants flourish in one climate, and others in another, according to the several purposes for which they were designed by a good Providence. Some which are generally useful will bear almost any temperature. This is particularly the case with grass. Nettles, I believe, are never touched by cattle of any description, neither will they trample upon them. What a secure retreat, therefore, do they afford for birds to build their nests amongst, and for hares to deposit their young amidst the shelter they afford! The same

remark applies in a great degree to furze, thistles, and the common bramble.

The extraordinary fact of trees and plants springing up in various places where they had not formerly existed, is confirmed by Mr. M'Gregor, in his valuable and interesting work on British America. He says that white clover springs spontaneously wherever the lands are cleared of the woods. He then adds, that it is an extraordinary circumstance in natural history, that wherever the original forest is destroyed in America, and the land left uncultivated, trees of a different species should spring up. This is always observed where lands have been laid waste by fire. The first year, tall weeds and raspberry and bramble bushes shoot up: then cherry trees, white birch, silver firs and white poplars appear, but seldom any tree of the genus previously growing on the space laid open by fire. Sir Alexander Mackenzie also observes, that the banks of the Slave Lake, formerly covered wholly with spruce fir, and birch, having been laid waste by fire, they produced subsequently nothing but poplars.

A few years ago, a house was built in Newcastle-on-Tyne, and the earth which was dug out of the foundation, was thrown on a piece of ground in the front, intended for a garden. The following spring a number of caper-plants came up: they were not common in that part of the country, and their appearance therefore created a good deal of surprize. Upon enquiry, it was found that some years before this ground had been a public garden; it therefore

appeared certain that these seeds had remained dormant whilst buried deep in the earth, and had sprung to life as soon as they were brought within the influence of heat and light.

These facts are sufficient to prove that seeds do not lose their vitality through a long period of time.

'Reasoning at every step he treads,
'Man yet mistakes his way,
'While meaner things, whom instinct leads,
'Are rarely known to stray.' COWPER.

THERE is a custom in the village in which I at present reside, and I believe in most others in England, for the churchwardens to give a certain sum in money for every dozen heads of sparrows which are brought to them. I verily believe, however, that the worthy churchwardens are grievously imposed upon, as I hear of the heads of chaffinches, tom-tits, and other harmless birds being substituted for them. Be this as it may, my object now is to endeavour to rescue the sparrow from the odium it has long been under, of doing great injury to the farmer. That it will feed on ripe corn and peas there can be no doubt, but this may be in a great measure prevented by setting boys to watch during the short space corn is ripe: with this exception, I believe sparrows are of the greatest utility to the farmer, devouring myriads of insects which would otherwise do him infinite injury: this is particularly the case when they have young ones, all of which are fed with insects and caterpillars, and I feel convinced that they would not have been so generally distributed over most parts of the world, had they not been intended for some useful purpose; indeed, many observant persons

are now aware that in places where sparrows have been destroyed, some sorts of fruit trees have been stripped of their leaves by caterpillars. I am the more anxious to prove the utility of sparrows, because they are birds possessed of a very kindly nature, living in great habits of sociability with each other. Several instances have been related to me of their having been observed feeding the young of other birds which have been in a state of captivity; and there is one well attested anecdote of a sparrow which, had been caught by the leg by a piece of worsted, from which it could not extricate itself, having been tended and fed by its congeners through a whole winter: when it was released, it was greeted with evident marks of satisfaction by all its former companions and friends. This kindliness of disposition does not appear to have escaped the notice of farming-men, who, as I observed before, are nevertheless great enemies to the whole race. I heard one particular instance of a farmer's servant having placed a nest of very young sparrows in a trap cage, and having caught forty old birds, all coming with food in their mouths to feed the helpless young. This is by no means a solitary instance of their readiness to assist the helpless of their own species. A lady residing in the neighbourhood of London, hung out a cage near her balcony, in which was a young bird, and it was fed for many weeks by sparrows. They afford a good lesson to man, and should teach him to aid and assist his fellow-creatures in all moments of their distress.

Whilst I am on the subject of the kind disposition which animals shew to each other, I will mention an anecdote which was recently communicated to me of the old English, or black rat; this animal is now become very scarce in this country. Unlike the Norway rat, which is fierce, and lives in little harmony, even with its own species, our original animals appear to have been sociable in their habits, and to have shewn kindness and friendship to each other. The fact referred to was communicated to me by the Rev. Mr. Ferryman, a clergyman in Sussex, an accurate observer of nature, and whose beautiful collection of specimens of British birds and animals, is second to none that I have ever seen; they are all stuffed by himself, and he has given them a great interest by displaying their peculiar habits; he is in his 85th year, but his mind is still as vigorous as ever. Besides being a good scholar and a naturalist, he has made many curious and important discoveries in mechanics; and it is to be regretted that his retired habits, and the secluded situation in which he lives, have prevented him from becoming better known. He informed me that some fifty years ago, when the old English rat was numerous, he resided at Quorn, in Leicestershire. Walking out in some meadows one evening, he observed a great number of rats in the act of migrating from one place to another, which it is known they are in the habit of doing occasionally. He stood perfectly still, and the whole assemblage passed close to him. His astonishment however was great, when he saw amongst the

number an old blind rat, which held a piece of stick at one end in its mouth, while another rat had hold of the other end of it, and thus conducted its blind companion. Mr. Ferryman has a large glass case of English rats, in which this interesting anecdote is commemorated with equal truth and fidelity. Mr. Ferryman also communicated to me the following anecdote of a rat, which I am in justice to him bound to admit he did not *implicitly* believe himself, neither are my readers required to do so: I merely give the story as I heard it. He said that he had an old friend, a clergyman, of retired and studious habits. When sitting in his room one day, he saw an English rat come out of a hole at the bottom of the wainscoat; he threw it a piece of bread, and in process of time he so familiarized the animal that it became perfectly tame, ran about him, was his constant companion, and appeared much attached to him. He was in the habit of reading in bed at night; and was on one occasion awoke by feeling a sharp bite on his cheek, when he discovered the curtains of his bed to be on fire. He made his escape, but his house was burnt down, and he saw no more of his rat. He was however convinced, and remained so for the rest of his life, that his old companion had saved him from being burnt to death by biting his cheek, and thus making him aware of his danger The marks of teeth were visible upon it, and the reader may put what faith he pleases on the supposition of the good clergyman. He himself was always indignant if any one doubted it.

That rats are endowed not only with an extraordinary degree of ingenuity and cunning, but with a faculty which approaches almost to a reasoning power, cannot be doubted; there is a sufficient number of well attested facts to prove this; the following is one of them. A ship on her voyage was not only much infested with rats, but proved so unfit for sea, that her stores were directed to be made over to another vessel. In doing this, the greatest care was taken that the rats should not gain access to the other ship, and in order to prevent it, the two vessels were anchored at some distance from each other, and the stores were removed in boats. When the crew were about to quit the vessel, the whole body of rats were seen to make their way down its sides into the sea, and to swim to the ship in which the stores had been deposited; this they would have penetrated, had not the vigilance of the crew prevented them. The vessel got under way, and the rats were left to their fate.

> 'This guest of winter,
> 'The mansion-loving red-breast, doth discern,
> 'By his quick eye that woolngly invites,
> 'Where table crumbs do fall. No casement,
> 'Hall-door, or out-house, but this bird
> 'Hath made her shelter, and haunt for food.
> 'When they most hop and peer about, I've noted
> 'The season is severe.' PARODY.

THE disappearance of water-hens from ponds during a hard frost has often surprized me, as I could not make out where they were likely to go for food and shelter when their natural haunts were frozen over. When the ice has disappeared the birds have returned. I have lately discovered, however, that they harbour in thick hedges and bushes, from which they are not easily driven, aware, probably, that they have no other shelter. They also get into thorn-trees, especially those covered with ivy, and probably feed on the berries, although their feet seem but ill-adapted for perching amongst trees. During the frost of the winter of 1832, a pair of water-hens kept almost entirely in a large arbutus-tree on the lawn of a house belonging to a lady at Hampton Wick, which was enclosed by a high paling, and no pond was near it. Here they probably fed on the berries of the tree, and other produce of the garden. The tree, how-

ever, was always their place of refuge if they happened to be disturbed when feeding in the garden.*

It is not frost, however, which makes king-fishers migrate from our neighbourhood in the winter, as we have had none, for instance, in the year 1833, but probably the high floods, which prevent their catching small fish as they are in the habit of doing, in shallow water. Though they abound on the banks of the Thames in summer and autumn, there are none, at least I have seen none, during the winter months. I hear of them, however, at that time in the neighbourhood of the sea, where, probably, food is abundant; and this, therefore, proves that king-fishers perform partial migrations.

The more I enquire into the habits of birds, the more cause I have to admire their different modes of proceeding under different circumstances. Some Cape geese, which had nests in the old oak pollards near the large pond in Richmond park, brought their young safely to the water: though it had been imagined that they did this with their beaks, I was not satisfied that it was so, and have now reason to think that it was in a very different way. A gentleman

* Moor-hens shew great affection for their young. A crow was seen to alight on the edge of the canal adjacent to Writtle-lodge, in Essex, near the nest of a moor-hen: immediately the cock bird flew at him with such force as to knock him over, and continued to attack him with so much spirit, that in less than a minute the crow flew away. The hen had laid three or four eggs, and there is little doubt that the crow intended to rob her nest.

has some high trees near a pond at his residence in North Wales, at the top of which several pairs of wild ducks breed every year, and convey their young safely to the ground. They have been frequently watched while they have been performing this operation. In every instance one of the wings of the duck appeared to be closed, while she flapped rapidly with the other, evidently for the purpose of breaking her fall. She always alighted near the foot of the tree, thus descending nearly perpendicularly. When one young duck was safely landed, she went for another, and when they were all brought down she led them to the water. This fact would shew that the young are not conveyed from high situations in the mouth of the parent bird, as has been generally supposed, but under the wing. The affection which ducks shew for their young is very striking.

I have heard also of a wild duck which built its nest for several years on the top of an old tower in Sussex, and always safely conveyed her young ones to the ground.* Wild ducks and teal breed also amongst the heather in Woolmer forest, and generally in the highest grounds. One of the woodmen, who has a cottage in the forest, informed me that he had found a teal's nest, with nine eggs in it, in a situation of this description.

Birds, indeed, frequently build in singular localities. One of the workmen employed in the gardens

* I have also frequently heard of their building in old rooks' nests on the top of high trees.

of Hampton Court Palace discovered, last summer, a kingfisher's nest in the bank of a small gravel-pit in the wilderness of that place, and within a short distance of the public foot-path leading through it, and which is much frequented. There were six eggs in the nest, which was composed as usual of small fish-bones, and was placed about two feet in the bank. The small gravel-pit was perfectly dry, and the workmen were in the constant habit of throwing the sweepings of the gardens into it. The old birds shewed but little fear of the workmen, and this led to the discovery of the nest.

A pair of robins built their nest this year (1834), on a flower-pot standing on the outside of my parlour window, and although the female was much looked at, and persons were continually passing, she sat upon her eggs in the most fearless manner. In the Magazine of Natural History it is stated that a pair of robins, for two years together, affixed their nest to the bible as it lay on the reading-desk, in the parish church of Hampton, in Arden, Warwickshire. The worthy vicar would on no account suffer the birds to be disturbed, and accordingly introduced another bible into the church, from which he read the lessons.

Some birds build their nests in the most exposed situations, while others of the same species place them in the most concealed spots they can find. An instance has been mentioned of tom-tits building in the groove of a pump-handle which was constantly at work. They are on some occasions a fearless bird,

and their habits are very peculiar. I have seen them hang by one foot while they have been in search of insects, appearing to swing backwards and forwards. During a very severe winter, a blue-cap came to the parlour window of a friend of mine, while he was at breakfast. On opening it, the little bird flew into the room, and shewed as much familiarity as a robin. He hopped on the breakfast table, fed on some crumbs, and then departed through the window: he returned, however, several times in the course of the day, and at night he climbed up the curtain-line with the rapidity of a squirrel, and roosted in one of the folds of the curtain. He continued to do this for a month, becoming every day more familiar, settling on my friend's shoulder and eating out of his hand. He was however one day missed, and was afterwards found dead in one of the folds of the curtain.

Tom-tits catch and feed upon the early butter-flies. They lay hold of them, as I have often observed, with their feet.

I am assured that the eggs of the horned Owl (Strix Brachyotus), have been found in a rabbit burrow in Suffolk; and I have found such owls on the Brighton downs, near a rabbit warren, without a tree or a shrub near them, squatting on the ground like a hare in her form. If my information be correct as to the place in which they breed, they appear to partake of the same nature with the burrowing owl of Prince Lucien Bonaparte (Strix Cunicularia), as described in his American ornithology. The appearance also of the two birds is somewhat similar.

The migration of woodcocks is still wrapped up in much mystery, as the bird itself seems so incapable of encountering rude gales of wind, and those storms which it must frequently meet with in passing over the ocean from one country to another. I was lately informed that a gentleman, while he was shooting one day near the banks of the Humber, disturbed a woodcock about the time of their annual arrival. The bird flew over a sand-bank and disappeared; the tide was at the same time flowing in. On following the woodcock over the sand-bank, he perceived it securely riding on the waves; and it remained upon them some time, as if quite accustomed to the water. Upon being again disturbed, it rose without effort, and flew away. If this account be correct, and I have no reason whatever to doubt it, it would shew, that woodcocks, in their annual flights, very probably settle on the water, when they are fatigued, to rest themselves; and snipes perhaps do the same. The summer snipe not only swims, but also dives, when wounded. This has been frequently observed by persons who are in the habit of shooting them, when they are found on the banks of the river Thames.

While on the subject of these birds, I may mention it as a curious fact, that both snipes and woodcocks are fattest in frosty weather—a circumstance difficult to be accounted for. That woodcocks breed freely in this country is now placed beyond a doubt. I passed the 26th and 27th of June, this year (1834), with the kind and hospitable owner of Hollycombe,

in Sussex; on each of those days I partook of a brace of young woodcocks; they were fat and excellent eating, and nearly full grown; their flesh was whiter than that of old birds; they begin to breed in the Hollycombe woods early in the year, generally about the middle of February. A hen woodcock, with her young ones, may frequently be seen in the woods, and sometimes running across the grass, opposite the house.

I have seen one or two specimens of woodcocks of a light hazel brown colour, one of which was shot in Sussex, and a white one was frequently seen in Mr. Talbot's woods, in Glamorganshire: the female is larger than the male. I have no doubt but that with a little care and trouble, young woodcocks, which had been hatched under a bantam hen, might be brought up and domesticated.

It is remarkable how readily birds, even those which seldom frequent the haunts of man, may be brought to place some degree of confidence in him. The family of H. Peter, Esq., of Harlyn, on the north coast of Cornwall, one morning at breakfast time, threw a piece of bread out of the window to a stray sea-gull, which happened to have made its appearance at the moment; the bird ate the bread and flew away. The next day, at the same hour, he appeared again, was again fed, and departed. From this time, for a period of eighteen years, the gull never failed to shew himself at the window every morning at the same hour, and to stalk up and down till he had received his meal (a basin of bread and

milk), when he instantly took his leave till the next morning. The only time he omitted to do this was during the period of the pilchards being on the coast, which lasted about six weeks in each year, and at this time he omitted his morning visit. At length he brought one of his own species with him to partake of his meal, and they continued to come together daily for about a fortnight, when they suddenly disappeared, and were never seen afterwards.

'There is endless room for observation in the wide field of 'natural history, which is boundless, yet investigation (where 'a man endeavours to be sure of his facts) can make but slow 'progress; and all that one could collect in many years would 'go into a very narrow compass.' MR. WHITE.

WE are indebted to Mr. White for a list of the summer birds of passage which he had discovered in his neighbourhood. His notices of them form not the least agreeable and useful part of his work on natural history. His accuracy remains undoubted, and the pleasure we derive from his remarks are undiminished. I am tempted to follow his example by laying before my readers a list of birds which have been found in a particular district in Suffolk. It will not have the charm of those short and pleasing notices which are added to Mr. White's list, but it will be found equally accurate; and it may induce some naturalist in another part of England to compare it with his, and perhaps to favour me with another catalogue and *methodus* of local birds. I have no merit to claim for the following list, being indebted for it to the Rev. J. Mitford, of Benhall, in Suffolk, whose talents and researches are already well known, both as a naturalist and an author.

I should mention that most of the birds were shot on the Snape River. It is a broad winding river,

which enters the sea at Orford, and is a favourite resort of sea birds.

List of Birds killed in Suffolk, and places where killed.

Sea Eagle. *Falco ossifragus.* Culfo, Yoxford and Triston.
Rough-legged Falcon. *Falco lagopus.* Haslewood, near Aldborough.
Stone Falcon. *Falco lithofolis.* Thelerton.
Ash-coloured Shrike. *Lanius excubitor.* Snape, near Aldborough.
Waxen Chatterer. *Ampelis garrulus.* Great Bealings and Hollesley.
Golden Oriole. *Oriolus galbula.* Saxmundam, Colchester.
Brown Starling. *Turdus solitarius.* Ipswich.
Ring Ousel. *Turdus torquatus.* Hasketon, near Woodbridge.
Cross-bill. *Loxia curvirostra.* Yoxford.
Gross-beak. *Loxia coccothraustes.* Haslewood, near Aldborough.
Mountain Sparrow. *Fringilla montana.* Hazlewood.
Mountain Finch. *Fring. montifringilla.* Hazlewood.
Siskin. *Fring: spinus.* Melton, near Woodbridge.
Great Plover. *Charadrius oedicnemus.* Orford (in the Walks.)

Sea Birds, and places where killed.

Bittern. *Ardea stellaris.* Aldborough.
Spoon-bill. *Platalea leucorodia.* Thorpe-few, near Aldborough (3 killed out of 7.)
Pigmy Curlew. *Scolopax pygmæa.* Thorpe-few.
Great Snipe. *Scolopax major.* Yarmouth.
Red Godwit. *Scolopax lapponica.* Thorpe-few.
Spotted Redshank. *Scolopax totanus.* Thorpe-few.
Turnstone. *Tringa morinella.* Aldborough.
Avoset. *Avosetta recurvirostra.* Butley Creek, near Orford.

Spotted Rail. *Gallinula porzana.* Snape River.
Grey Phalarope. *Phalaropus lobatus.* Thorpe-few. Snape
Eared Grebe. *Podiceps auritus.* Aldborough.
Black-chinned Grebe. *Podiceps hebridicus.* Snape River.
Red-throated Diver. *Colymbus septentrionalis.* Snape River.
Speckled Diver. *C. stellatus.* Snape.
Sandwich Tern. *Sterna Cantiaca.* Aldborough and Orford
Roseate Tern. *Sterna dougalli.* Do. Do.
Black Tern. *Sterna fissipedes.* *Culpho, near Grundisburgh, at least 10 miles from the Sea.
Black-backed Gull. *Larus marinus.* Bawdsey.
Lesser Do. Do *Larus fuscus.* Thorpe-few.
Glaucus Gull. *Larus glaucus.* Aldborough.
Black-headed Gull. *Larus ridibundus.* Aldborough.
Little Gull. *Larus minutus.* Two specimens shot at Languard Fort.
Fork'd-tail Petrel *Procellaria leachis.* Aldborough.
Goosander. *Mergus merganser.* Snape River.
Dun Diver. *Mergus Castor.* Thorpe-few and Snape River.
Red-breasted Merganser. *Mergus serrator.* Hollesley and Snape River.
Smew *Mergus albellus.* Snape River.
White-fronted Goose. *Anas albifrons.* Aldborough (2 shot.)
Ring Duck. *Anas spectabilis.* Aldborough (female.)
Shoveller *Anas clypeata.* Snape River.
Long-tail'd Duck. *Anas glacialis.* Hollesley (male and female.)
Garganey *Anas querquedula.* Thorpe-few.
Gannet. *Pelecanus bassanus.* Snape River.
Black-bill'd Auk. *Alca pica.* Aldborough
Little Auk. *Alca alle* Aldborough.
Cream-coloured Plover.† *Charadrius Gallicus.* Snape and Aldborough.

---

* One was killed in Bushy Park in 1833.

† According to Montagu, there are only four recorded instances of this rare bird having been killed in Europe. This

Black Stork. *Ciconia niger?* Shot near Grundisburgh in 1832, and remains in possession of Mr. Diton, surgeon, of that place.

Wild Swan. *Anas cygnus niger.* Snape River.

Cambridge Godwits. *Scolopax Cantabrigiensis.* Iken.

Sea Birds, and places where found.

Razor-bill. *Alca torda.* Snape.

Wagel. *Larus nævius.* Aldborough.

Pochard. *Anas ferina.* Snape (in a flock of more than 100, seen October 17, 1834.)

Dun Diver. *Mergus castor.* Theberton.

Variety of Pewit Gull. *La grande mouette.* Snape.

Greater Coot. *Fulica atterima Bewick.* Iken (rare.)

Purre. *Tringa cinclus* Snape.

Greenshank. *Scolopax glottis.* Snape.

Whimbril. *Numenius phæopus.* Snape.

The Hoopoe. *Upupa epops.* Not uncommon in sandy lanes near the Sea.

The Roller. *Coracias garrula.* A pair killed and stuffed at Sir T Gooch's, at Benacre.

Horn Owl. *Strix otus.* Shot at Sudburn Park, and supposed by the keepers to come over with flights of Woodcocks.

Moor-buzzard. *Circus æruginosus.* Sutton Walks (breeds there annually.)

Goshawk. *Astur palumbarius.* Haveningham.

Short-eared Owl. *Otus brachyotus.* Langham (shot in a turnip field.)

Greater Redpole. *Linaria linota.* A few flocks seen in the summer.

specimen was shot by an old shepherd on a piece of waste ground near the village of Snape, and it appeared to be perfectly tame and fearless of man.

Night Jar. *Nycticheledon Europæus.* Fristen Moor (breeds there.)

Dotterell. *Charadrius morinellus.* Theberton.

Spotted Sandpiper. *Muscicapa grisola.* Iken.

Purerstone. *Strepsilas collaris.* Felixston.

Pintail Duck. *Dafila caudacuta.* Friston Dairy.

Golden-eye Duck. *Clangula Vulgaris.* Snape River

Cormorant. *Corbo cormoranus.* Snape River.

'But who the melodies of morn can tell?
'The wild brook babbling down the mountain's side;
'The lowing herd; the sheepfold's simple bell;
* * * * * * * *
'The hum of bees, and linnet's lay of love,
'And the full choir that wakes the universal grove.'

Those who reside in the country can appreciate the enjoyment of the first fine days of spring. Nature then puts on her most smiling aspect, and everything looks joyous: frost and snow have disappeared, and the fields are clothed with verdure.

Diffugere nives; redeunt jam gramina campis
Arboribusque comæ:
Mutat terra vices; et decrescentia ripas
Flumina prætereunt:
* * * *
Frigora mitescunt Zephyris;

It is impossible not to enjoy such moments. As for myself, I am never so happy as when I am strolling on the bank of some clear and beautiful stream in a fine spring day: the scenery, the birds and flowers, all add to my pleasure. I like to see the 'glittering streamlet play,' and to hear 'the 'prattle of the purling rill,' as Thompson calls the sound made by a brook as it passes over a bed of pebbles—

'The little brook
'That o'er its flinty pavement sweetly sung'

No one appears to have appreciated the charms of the country more than Horace. In his beautiful ode in praise of a country life, he details the pleasures to be derived from it, in a manner which shews how capable he was himself of enjoying its attractions. After describing how happy the man must be who cultivates his own land, prunes and engrafts his fruit-trees, or sees his lowing cattle in some lonely vale, and stores his honey, and shears his sheep, and gathers in his fruits, he exclaims—

'Libet jacere modò sub antiquâ ilice,
'Modò in tenaci gramine:
'Labuntur altis interim ripis aquæ;
'Queruntur in sylvis aves;
'Fontesque lymphis obstrepunt manantibus,
'Somnos quod invitet leves.

I am apt to dwell on the charms of the country, because so much of my own happiness is derived from it, and because I am persuaded that so many others might enjoy the same pleasure. The mere act, however, of living in the country will not be sufficient, there must be a decided fondness for the occupations it affords: visiting the cottages of the peasantry, and relieving their wants, is one of these. The cultivation of flowers should not be neglected, as it is another of the resources which makes a country life agreeable, and affords a pleasure which is not only inexhaustible, but is one of the most fascinating kind.

To this may be added the study of natural history, which alone is sufficient to keep the mind employed, and prevent the day from becoming dull or tedious. It is a study also calculated to make us wiser and better, as the more we contemplate the works of creation, the more reason we shall have to entertain a deep sense of Almighty power and goodness;—

> 'For God is paid when man receives—
> 'To enjoy is to obey.' POPE.

Those persons to whom the employment of their minds is irksome, and who gradually lose their intellectual powers, because they will not take the pains of exerting them, will be incapable of appreciating the pleasures and benefits to be derived from a well-regulated life, passed in the country. Those, however, who are willing to try the experiment, may be assured that it will be their own fault if their time is not both usefully and agreeably employed: they will become cheerful and instructive companions, kind and humane in their dispositions, and have their moral character improved and made more fit for that great change which, sooner or later, must happen to us all.

I cannot refrain from quoting what an elegant writer* has said on the subject in question.

'We are affected with delightful sensations when 'we see the inanimate parts of the creation, the 'meadows, flowers and fields, in a flourishing state. 'There must be some rooted melancholy at the

* SEED.

'heart, when all nature appears smiling about us, to 'hinder us from corresponding with the rest of the 'creation, and joining in the universal chorus of joy. 'But if meadows and trees in their cheerful verdure '—if flowers in their bloom, and all the vegetable 'parts of the creation in their most advantageous 'dress, can inspire gladness in the heart, and drive 'away all sadness, but despair; to see the rational 'creation happy and flourishing, ought to give us a 'pleasure as much superior, as the latter is to the 'former in the scale of beings. But the pleasure is 'still heightened, if we ourselves have been instru- 'mental in contributing to the happiness of our fel- 'low-creatures—if we have helped to raise a heart 'drooping beneath the weight of grief, and revived 'that barren and dry land, where no water was, 'with refreshing showers of love and kindness.'

Under almost every circumstance of disquietude or of solitude, alone in one's room, or wandering far away, from the haunts of mankind, a lover of Nature has always something around him not only to occupy his thoughts, but to afford him gratification and pleasure. When I say pleasure, I mean that pleasure which arises from the occupation of the mind when devoted to a delightful study, and which cheers us with the conviction that our time is not unprofitably spent. As we proceed in the contemplation of the works of Nature, her beauties are gradually unfolded to our view, as if she were pleased that her works had excited our wonder and admiration; the study of them is indeed unbounded, for

the objects she presents to our notice are infinite, unceasing, and delightful.

I was pleased at an observation made to me lately by a nurseryman. He said that he thought it impossible that any one could entertain atheistical notions, who studied the nature of plants, and observed the different uses for which they were designed by a benevolent Creator, according to the nature of the different climates in which they are found. He shewed me the pitcher-plant which flourishes only in very hot countries. Its tube is about as long again as the bowl of a tobacco-pipe, and is filled with an aqueous fluid. This supplies water for birds and is admirably adapted for the purpose. The cactus tribe grow in hot sands, and afford both food and water, and we generally find that according to the wants of man and animals in different countries, food best adapted for their use is bountifully supplied. The water melon is found in the parched up deserts of Africa.

There is an extreme sensibility in the tendrils of vines, and they afford another proof how admirably Nature has adapted every thing to fulfil the purpose for which she designed it. Without this extreme sensibility of the tendrils, the vine would fall to the ground, and its fruit would not ripen. As the shoot grows, the tendrils are thrown out, and at the end of each there is a little hook. As soon as this fastens upon any thing, the tendril twists itself about it, turning round and round, till it has completely contracted itself. The moisture which occasioned its

flexibility then recedes and it becomes hard. Its tenacity is then so great that it requires some effort to disengage it. The two first tendrils which the branch, or shoot of a vine throws out, are, I observe, much stronger than the subsequent ones.

I watched this summer the shoot of a vine which came across one of the windows of my house. At first only two strong tendrils appeared. The second came in contact with the glass, and though it had nothing on which it could lay hold, its mere friction against the glass occasioned it to distort itself till it became like a piece of knotted twine. The other tendril had nothing which it could touch, but I observed that it altered its position every day, turning itself about, as if seeking for an opportunity of fulfilling the use for which it was designed. If I held a stick against it for a short time, it was evidently affected by it, and this was seen by a change in its previous position.

These details may appear trifling, but I cannot consider them as such. They are facts and circumstances in the economy of Nature which prove that nothing was made by chance, or for ends not 'admirable.'

Vines which are not trimmed 'till March, bleed much, and will continue to do so until the leaf is fully expanded. It is remarkable that although this is the case while the trees are leafless, yet lop them as much as you please when the foliage is out, and they will not shed one drop. Dr. Hales was not acquainted with this circumstance when he cut off a large bough

from his vine late in the spring, and it was fortunate for science that he was not. His solicitude for his vine, and his various attempts to stop the effusion of the sap, led him, step by step, to many expedients, which by degrees brought on abundance of curious experiments, and ended in that learned publication known by the name of *Vegetable Statics*. This work has done much honour to its Author, and has been translated into many modern languages.

The culture of Virgil's vines corresponds very exactly with the modern management of hops. For instance, in the perpetual diggings and hoeings, in the tyeing to the stakes and poles, in pruning the superfluous shoots, &c. and the alleys between the rows of hops are harrowed sometimes with a small triangular harrow, drawn by one horse, and guided by two handles. This occurrence brings to ones mind the following passage:—

' ——— ipsa
' Flectere luctantes inter vineta juvencos.'

It is interesting to compare the customs of the antients, with those of modern times. Cottagers are in the habit of striking a brass pan to make a noise when their bees are swarming. So it was when Virgil wrote his fourth Georgic;—

' Tinnitusque cie, et Matris quate cymbala circum.'

' And ring the tinkling brass, and sacred cymbals sound.'

'The shades of night were scarcely fled,
'The air was mild, the winds were still;
'And slow the slanting sun-beams spread
'O'er wood and lawn, o'er heath and hill.

'From fleecy clouds of pearly hue
'Had dropt a short but balmy shower,
'That hung like gems of morning dew
'On every tree and every flower:

'When bursting forth to life and light,
'The offspring of enraptured May,
'The Butterfly, on pinions bright,
'Launch'd in full splendour on the day.'

BUTTERFLY'S BIRTHDAY

INSTEAD of saying that animals are possessed with instinct, would it not be more proper to say that they are taught by Almighty God to act in that way which is best adapted to their nature *at the instant* it is necessary for them to act? Should this supposition be correct, how unceasingly must the eye of Providence be directed to all its creatures! What a vast field is opened to us for admiration and wonder! Is that little insect which I see digging a hole in the sand, afterwards dragging and thrusting a caterpillar into it for food for its yet unborn offspring, and then covering it up, and "marking the place with two little pieces of wood"*—is this insect under the im-

* RAY.

mediate direction of an Omnipotent Guide? Is it taught of God? Yes! so it is. He who feeds the young ravens, and is mindful of the fall of the sparrow, He who numbers even the hairs of our heads, regulates the proceedings of the most minute of insects. Nothing appears to me more wonderful than this superintending Providence: it should fill us with awe, with fear and devotion. With awe at the magnitude of his power, and his unceasing vigilance; with fear of offending him who watches every action of our lives, and is acquainted with every motive of our hearts; and with devotion when we reflect on the unbounded love and care which he bestows upon us, and upon all his created beings. The organization of a bird's nest, the construction of the cell of a bee, the mathematical formation of the web of a spider, all afford proofs, to my mind, of a Divine Guide and Teacher.*

* It has been well observed by an eminent naturalist, that no religious doctrine is more strongly established by the history of insects than that of a superintending Providence, and that insects are a book in which whoever reads under proper impressions, cannot avoid looking from the cause to the effect and acknowledging his eternal power and godhead thus wonderfully displayed; and whoever beholds these works with the eye of the body, must be blind indeed if he cannot, and perverse indeed if he will not, with the eye of the soul, behold in all his glory the Almighty Workman, and feel disposed, with every power of his nature, to praise and magnify

'Him first, Him last, Him midst, Him without end.'

KIRBY

'Let no presuming impious railer tax
'Creative wisdom, as if aught was form'd
'In vain, or not for admirable ends.'

The affection which insects shew for their young is not one of the least curious facts in natural history. That little minute creatures should have warm affections, that they should evince surprising boldness in the protection of their young, and display a restless and indefatigable anxiety for their welfare, guarding, feeding and fostering them, is not a little to be admired. This is particularly the case with bees and ants. Mr. Anderson, in his Recreations in Agriculture, says that the Russian shepherds ingeniously avail themselves of the attachment of ants to their young for obtaining, with little trouble, a collection of the pupæ, which they sell as a dainty food for nightingales. They scatter an ant's nest upon a dry plot of ground surrounded with a shallow trench of water, and place on one side of it a few fir branches. Under these the ants, having no other alternative, carefully arrange all their pupæ, and in an hour or two the shepherd finds a large heap, clean and ready for market.

I had an interesting account lately sent me of the bees of the West Indies. It was from an observant naturalist now residing there. He says, 'I have 'been examining a hive of bees belonging to an acquaintance at Demerara. They are in a tall bell-'shaped glass, over which is placed a large thick 'wooden shade. On removing the shade, how dif-'ferent the appearance from what I used to witness

'in your hives! In the first place, the bees have no 'stings: secondly, they form their breeding cells on 'the top of the hive, in small separate clusters, 'something like the honeycomb in England; but it 'hangs down in separate pieces, perhaps two inches 'quare, with the cells on one side only: thirdly, the 'honey is deposited in separate sacks, all distinct, 'and attached to the hive at the bottom. Each bot-'tle or sack (they resemble exactly the broad bot-'tomed long necked bottles we see in Holland) is 'attached to the hive, and bulges out, so as to hold 'a considerable quantity of honey, perhaps two 'drachms. These sacks are placed regularly round 'the bottom of the hive. The breeding-cells, or 'rather the breeding-sheets, are on the top of the 'hive, and as they seem to be attached by a thin 'layer, I have no doubt that they can be put in mo-'tion laterally, so as to create a circulation of air in 'the hive necessary to the well-being of their young. 'The bees are of a smaller size than ours, and to 'prevent their being intruded upon by other insects 'they contract the entrance to a very small size.'

With the conviction that nothing is done in Nature without having for its object some good and benevolent purpose, one feels desirous to ascertain, if possible, the reason why bees should have stings in one country, and be without them in another. One would suppose that they were equally required for self protection in both. We know that in hot weather, bees are extremely irascible; if therefore they were furnished with stings in the West Indies, they

would probably attack every thing which came near them, and thus become so intolerable a nuisance, that their utility to man would in a great measure be defeated. The circumstance also of the bees depositing their honey in small sacks, instead of cells, as with us, is curious, and shews a wise provision of Nature. If this was not the case, the extreme heat of the climate would melt the cells, and the honey would of course run out, as I have known to be the case in very hot weather in this country. The small sacks therefore are a most ingenious contrivance, and being placed at the bottom of their hive, their weight is supported, and it is the coolest place for them. The young brood can bear great heat, and are therefore placed at the top of the hive, but where air can be introduced if necessary. It is impossible not to admire and wonder at this beautiful economy, which is to be seen indeed through all the works of nature,—

> ' Nunc age, naturas apibus quas *Natura ipsa*
> ' Addidit, expediam.
> ' Apis advocat artes
> ' Ingeniosa suas '

There is a species of ant at Trinidad, known by the name of the Parasol Ant, (Formica cephalotes). Its roads to its nest are clearly defined, and on returning to it along them, each ant carries over it a small piece of green leaf, as if to protect itself from the hot sun. From this circumstance it gets its name. It is probable, however, that these pieces of

green leaf are used either in the construction of the nest, or for sheltering their pupæ. An officer of engineers, who resided some years at Trinidad, and had frequently observed the ants carrying the leaf, informed me that a general idea prevails there, that if the ant's nest was opened two snakes would always be found at the bottom of it, and are supposed to feed on the leaves. I believe, however, that no species of snake feeds on vegetable substances. The nests of these ants go to a depth of many feet. Stedman, in his account of Surinam, mentions a large ant, an inch long, which has the same habit as the ant of Trinidad. He says it was a pleasing spectacle to behold this army of ants marching constantly in the same direction, and each individual with its bit of green leaf in its mouth. There can I think be little doubt but that the protection of their young, and not of themselves, is the cause of so much labour.

I have noticed elsewhere a fact which came under my own observation of the great affection shewn by a spider for its yet unborn young ones. Under circumstances calculated to fill it with alarm and apprehension for its own safety, its maternal affection was unbounded, and only terminated with its life.

The same observation applies to the ear-wig. When I have scattered her young in various directions, she has been indefatigable in collecting them together again, alike insensible to trouble or danger.

An interesting account may be found in Kirby and

Spence's Entomology of a field bug, (Cimex griseus) which shews extraordinary affection for its young. The family consisted of thirty or forty, which she conducted about as a hen does her chickens. She never leaves them, and as soon as she begins to move, all the little ones closely follow, and whenever she stops assemble in a cluster round her. On cutting a branch of birch peopled with one of these families, the mother shewed every symptom of excessive uneasiness. In other circumstances such an alarm would have caused her immediate flight; now she never stirred from her young, but kept beating her wings incessantly with a very rapid motion, evidently for the purpose of protecting them from the apprehended danger.

The history of insects generally is well worth the attention of a naturalist. Their anatomy—their habits*—the beauty of many of them—their distribution and habitations, the benefits we derive from them, all these are replete with interest and instruction.

If we look at the larger animals, we shall have equal cause to admire the care which has been bestowed upon them. For instance, the dams of those young animals which require much warmth, such as rabbits, squirrels, &c. have an abundance of fur under their bellies. A great part of this is stript off

* Dr. Paley observes that the production of beauty was as much in the Creator's mind in painting a butterfly, or in studding a beetle, as in giving symmetry to the human frame, or graceful curves to its muscular covering.

for lining the nests, but Nature seems to have another object in view, viz. that of enabling the blind and helpless young to find the teats of the dam more readily. Kittens when they are born do not require so much warmth, neither is the fur of the dam so very thick. Leverets when they are born can see, and are also well covered with a close, thick fur. So provident is Nature! I may here mention that by Nature is meant the aggregate of all created beings, and of the laws imposed on them by the supreme Creator.

Let us look at a large flock of gregarious birds at feed. I have never seen them without observing that a sentinel was set to watch on the top of some tree or eminence. By what language, or by what instinct is this bird made to watch for the safety of others, when he was probably as hungry as those which were feeding near him?

If we examine the foot of the Chamois, we shall find how admirably it is adapted for enabling the animal to bound from rock to rock, and to ascend

> ' the craggy steep
> ' Where the poor dizzy shepherd crawls with care,
> ' And clings to every twig.'

One would suppose that instinct alone would teach birds to follow the same mode of fabricating their nests according to their respective species. But this is not always the case, as we know they are taught to vary them according to their different circumstances, or the situations in which they may be

placed. Birds which build on the ground have seldom any thing but a few bits of grass for a nest. This they do by a kind provision of Nature, as, if they made much of a nest, the hens, when sitting, would be much more exposed to observation. While we admire also the dazzling plumage of a male bird, we may wonder why the female appears so infinitely below him in the scale of beauty. Is it because she is to be considered as more degraded, or as an inferior being? When we see the male expanding his rich and varied plumage in the sun-beams, let us not forget that on the female devolves all the offices of love and affection. She hatches, feeds, and protects, at the risk of her life, her helpless young ones, and what we may consider as lowering her in the scale of creation, is on the contrary an act of the greatest kindness and consideration. Her want of beauty is her chief protection, and her very humility saves her from a thousand perils.

'Who taught the nations of the field and wood
'To shun their poison, and to choose their food?
'Prescient, the tides and tempests to withstand,
'Build on the wave, or arch beneath the sand?' POPE

BOTH horses, dogs, and indeed many other animals, give extraordinary proofs of their intelligence and reflection. I have known horses open a door or gate which was fastened with a small latch, a proof that they must have been aware that it was the cause of the door keeping shut. Others will rub off their head-stalls, however tightly fastened, knowing that it occasions their confinement to one place. I saw a raven lately at the inn at Lyndhurst, in the New Forest, which had a chain of about three feet long fastened to a ring round its neck. Whenever the bird fled or hopped about, it always gathered up the chain in its mouth, to prevent the weight of it hurting his neck. A gentleman of my acquaintance has a pig which stands upon her hind legs and reaches the branch of an apple-tree, which she shakes either with her mouth or fore-feet, to make the apples fall that she may feed upon them, a proof almost of the existence of a reasoning faculty. "However, apparently pigs may be asleep in calm weather, the moment the wind rises, they hasten to the nearest apple

or oak-trees, aware that the wind will shake down food for them.

Captain Lyon relates that he had an arctic fox (Canis Lagopus) whose tameness was so remarkable, that he did not like to have him killed, but confined him on deck in a small hutch, with a scope of chain. He adds, that this little animal astonished every one by his extraordinary sagacity, for, during the first day, finding himself much tormented by being drawn out repeatedly by his chain, he at length, whenever he retreated to his hutch, took it carefully up in his mouth, and drew it so completely after him, that no one who valued his fingers would endeavour to take hold of the end attached to the staple.

Captain Lyon also states of these animals that their bark is so modulated as to give an idea that the fox is at a distance, although at the very moment he lies at your feet. Some of them appeared perfectly tame, although timid, from the moment of their captivity. When they are in apparently deep sleep, they open their eyes at the slightest sound which is made near them, although they pay no attention to sounds when at a short distance. They appear to have the power of decoying other animals within their reach, by imitating their voices. Captain Lyon says, also, that while tenting, a fox was observed prowling on a hill side, and heard for several hours afterwards in different places, imitating the cry of a brent goose.

In addition to these facts which serve to prove the almost reasoning faculties of animals, and which

Grotius calls the '*extranea ratio*,' many others might be brought forward. Elephants, for instance, certainly appear to have the power of reasoning, and shew also a sensibility on being reproved, which is quite extraordinary. Many animals also shew a pride in their superiority, if I may call it so, and cannot bear to feel humbled. This is particularly the case with the elephant, the horse, and with the game-cock. It is a curious and well-known fact, in Switzerland, that if the bell which is fixed to the leading cow of a herd (and the finest and largest is generally selected for the purpose) is removed, the cow is frequently known to pine away and die.

Cats are generally persecuted animals, and are supposed to shew but little attachment to those who are kind to them. I have known a cat, however, evince great uneasiness during the absence of her owner, and it is stated that when the Duke of Norfolk was committed to the tower in the reign of Queen Elizabeth, a favourite cat made her way into his prison room by getting down the chimney.

Cats have been known also to do their best to protect the property of their masters, as well as dogs. A man who was sentenced to transportation for a robbery, informed me, after his conviction, that he and two others broke into the house of a gentleman near Hampton Court. While they were in the act of plundering it, a large black cat flew at one of the robbers, and fixed her claws on each side of his face. He added that he never saw any man so much frightened in his life.

Mr. White, in his Natural History of Selborne, states, that of all quadrupeds, cats are the least disposed towards water, and will not, when they can avoid it, deign to wet a foot, much less to plunge into that element. The following fact, however, communicated to me by a friend who lived several years in Jamaica, will prove that they take the water, and is also another instance of the attachment of animals to the place where they were bred. Being in want of a cat, one was given him which was not full grown. It was put into a canvas bag, and a man on horseback brought it a distance of five miles from the place where it was bred, and from which it had never been removed before. In doing so, he had to cross two rivers, one, named the Mino, which was about eighty feet wide and two and a half feet deep, running strong. The other, called Thomas' river, was wider and more rapid, but less deep. Over these rivers there are no bridges. The cat, when it arrived, was shut up for some days, and when supposed to be reconciled to her new dwelling, she was allowed to go about the house. The next day, however, she was missing, and was found shortly afterwards at her old abode.

A family residing at Newcastle-on-Tyne went one summer to Tynemouth, leaving their house in the care of two female servants. One evening, when the servants were sitting together in the kitchen, their attention was attracted by a cat, which went up into a laundry over the kitchen, and then returned to them and mewed. The cat did this so

often, that the servants were induced to go up stairs to see what she wanted. When they got into the laundry, they found a man concealed in the chimney. One of the maids fainted, and the other gave the alarm to their neighbours, but in the mean time the man made his escape out of the window and over the roofs of the adjoining houses.

A favourite cat, much petted by her mistress, was one day struck by a servant. She resented the injury so much, that she refused to eat any thing given to her by him. Day after day he handed her dinner to her, but she sat in sulky indignation, though she eagerly eat the food as soon as it was offered to her by any other individual. Her resentment continued undiminished for upwards of six weeks. The same cat having been offended by the housemaid, watched three days, until she found a favourable opportunity for retaliation. The housemaid was on her knees, washing the passage, when the cat flew at her, and left indubitable marks on her arms, that no one could ill use her with impunity It is, however, but fair to record her good qualities as well as her bad ones. If her resentment was strong, her attachment was equally so, and she took a singular mode of shewing it. All the tit-bits she could steal from the pantry, and all the dainty mice she could catch, she invariably brought and laid at her mistress's feet. She has been known to bring a mouse to her door in the middle of the night and mew till it was opened, when she would present it to her mistress. After doing this she was quiet and contented.

A lady had a tortoise-shell cat, and a black and white one. A few years ago, the latter was observed to carry her kitten, when two or three days old, to her companion, who brought it up with her own kitten, though of a different age, with all the tenderness of a mother. This was done time after time for several years, but last year it was reversed, the black and white cat taking her turn to discharge the duties of a wet-nurse to the kitten of the other. It is probable that a deficiency of milk was the cause of the cats not suckling their young. It is not surprising that one of them should adopt the kitten of another, but it appears that some faculty nearly approaching to reason must have shewn them the necessity of procuring a substitute.

Notwithstanding these anecdotes of cats, I must confess that they are not general favourites. An agreeable writer makes the following contrast between the dispositions of dogs and cats. He says, 'I do not love a cat—his disposition is mean and 'suspicious. A friendship of years is cancelled in a 'moment by an accidental tread on his tail or foot. 'He instantly spits, raises his rump, twirls his tail 'of malignity, and shuns you, turning back, as he 'goes off, a staring vindictive face full of horrid 'oaths and unforgiveness; seeming to say 'perdi- ''tion catch you! I hate you for ever.' But the 'dog is my delight. Tread on *his* tail or foot, he 'expresses for a moment the uneasiness of his feel- 'ings, but in an instant more the complaint is ended. 'He runs around you, jumps up against you, seems

'to declare his sorrow for complaining, as he was 'not intentionally hurt; nay, to make himself the 'aggressor, he begs, by whinings and lickings, that 'his master will think of it no more.' Every one must allow the accuracy of this description. Cats are, however, persecuted animals,—

'Cats are thought imps,————
'And boys against their lives combine,
'Because 'tis said that cats have nine.'

MISCELLANEOUS OBSERVATIONS ON NATURAL HISTORY.

'Yarrell to thee, this trifling prate
'I, with affection, dedicate,
'Because thou prizest things that are
'Curious and unfamiliar.'

HERRICK'S HESPERIDES

I AM assured that Sir Stamford Raffles, while he was at Java, had a pet monkey, which, on being corrected for some faults, twice tried to destroy itself, and at last succeeded in doing so. As suicide has hitherto appeared to be confined to the human race, this anecdote, if correct, brings this tribe of mammalia nearer to us than might be wished.

My brother's cat, when she cannot get at the cream, which she often tries to do before he is seated at his breakfast table, puts her paw into the cream jug, and then licks it. The experiment is frequently tried for the amusement of visitors. When I give my honest old terrier hot milk and water, he puts his paw into the basin several times, in order to try if he may venture to drink without scalding his tongue.

A friend of mine, who resided near London, had in his dining parlour a large marble basin, in which he kept four gold and silver fish. Three of them, at length, died, and in the winter, just at the beginning of a hard frost, he went to pass about a week in London. On his return, in consequence of there not having been a fire in the room during his absence, he found the water in the marble basin one solid body of ice, and the remaining fish frozen in the middle of it. He immediately broke the ice around it, took it out, and found it to all appearance lifeless, and looking perfectly crystallized. This was about noon. Leaving the fish in the basin, and a fire having been lighted, he, after dinner, more from accident than any other cause, looked at the basin, and, to his astonishment, saw the ice in a great measure thawed, and the fish moving. At midnight, when he went to bed, it was as lively as usual.

I have been assured by several respectable persons, who have lived many years in the East Indies, that ponds which have become perfectly dry, and the mud hard, have, after the rainy season, been found with fish in them, although no stream communicated with them, or any passage or other means by which fish could be admitted. The fact is known to almost every observant resident in the East Indies.

In those countries where there are long winters,

and but little day light, oil, which is then so necessary, is procured in the greatest abundance from different marine animals and fish.

Pennant calls the herring a stupendous gift of Providence to the inhabitants of the British Isles. We ought to reflect, with veneration and awe, on the mighty Power which originally impressed on these creatures the instinct that directs and points out the course that blesses and enriches these islands. It is stated that there were, at one time, enclosed in St. Ives' Bay, Cornwall, at the shooting of the nets, 7000 hogsheads of pilchards, each hogshead containing 35,000 fish, in all, 245,000,000. The herring will rise at a fly.

I am informed, by an old shepherd, that sheep always feed greedily before rain. They thus fill their bellies as soon as possible, and retire for shelter under a hedge, where they can chew the cud.

Animals must in some degree enjoy a happiness, or rather be exempt from sources of misery which embitter the life of most persons, namely, that they have no anxiety either respecting death, or the means of future subsistence, in short, no power of anticipating evil.

Solitude seems to be very distressing to animals. At the Zoological Farm, on Kingston Hill, animals have been put together to prevent their pining to death.

Most small birds come to their full growth in about a fortnight after they are hatched. Were they to lie a long time in the nest in a helpless state, much fewer would escape. Some accident or other would destroy the whole breed.

Mr. White calls the Fly-catcher a harmless and *honest* bird, because it meddles with nothing but insects.

Blackbirds devour my mulberries. Those which fall to the ground are attacked by numerous flies, which occasions swallows to hawk under the tree all day long. The same cause attracts many wag-tails to the spot, and it is amusing to watch their quickness and nimbleness in catching the flies.

A Razor-bill (alca torda) was shot last winter (1831) on the pond at Pain's Hill, near Cobham, and a gull (larus canus) about the same time, on the river Mole, near Hampton Court. A ruff (tringa pugnax) and a tern, or sea-swallow (sterna hirundo) were shot the same year by one of the keepers in Bushy Park.

I observe that lapwings (vanellus cristatus) lay their eggs in low moist situations in Richmond Park, probably the grass is stronger, and their young can be more readily concealed. As soon, however, as the young are strong enough to accompany them, the old birds take them to higher grounds. The young run as soon as they are hatched, but they cannot fly till they are nearly full grown.

The fact of rats being able to remove eggs from one place to another, without breaking them, seems to be pretty well ascertained. I was assured that on one occasion they had taken them from a box in which they had been placed. It is not easy to guess how they contrive to do either the one or the other.

When I have disturbed a fern owl (caprimulgus) in the day time, it takes a very short flight, and when it settles, it appears to look around it with astonishment. It is mobbed, like the cuckoo, by small birds.

Young cuckoos are frequently found in the titlark's nest in Richmond Park. Both birds abound in this park.

———

February 12th.—The head keeper in Bushy Park this day sent me a bittern (ardea stellaris) shot on

Hampton Common. I had it dressed, and it was very fat, and excellent eating.

There is something to me very pleasing and exhilarating in the note, or, as Mr. White calls it, the 'shrill,' of a grasshopper, as I walk in the meadows on a fine sunny day. Cowley has some pretty lines on this insect.

> Happy insect! what can be
> In happiness compared with thee?
> Fed with nourishment divine,
> The dewy morning's gentle wine:
> Nature waits upon thee still,
> And thy verdant cup does fill
> All the fields which thou dost see,
> All the plants belong to thee;
> All that summer hours produce
> Fertile made with easy juice.
> Thee, country hinds with gladness hear,
> Prophet of the ripen'd year.

I think I have ascertained beyond a doubt, or rather to my own satisfaction, that the cadis-worm is not the grub of the common May-fly, having found the cadis long after the May-fly has appeared on the water.* Another proof is, the appearance of the

* I have also been informed that the May-fly is never found on the river Wandle, where the cadis abounds, and may be found at all seasons of the year. This is also the case with respect to a pond in Surrey, where the May-fly is seldom seen.

husks, or exuviæ, which the May-fly casts from it. These husks are very different from any thing I have been able to discover connected with the cadis prior to its emancipation. The exuviæ of the May-fly are a thin brownish covering, of the finest texture. The fly appears to split these cases open at the back, probably by some muscular motion of the body, and they may be seen afterwards floating on the water, and hanging upon bushes. These cases, on being examined, will be found to have covered every part of the fly; the cases which protected the three long hairs (if I may call them so) of the tail, being quite perfect. May-flies do not appear to feed during the three or four days of their existence. It is supposed that the eggs deposited by the fly do not arrive at maturity till two years afterwards. I shall never forget being at Denham, near Uxbridge, at the time of the first appearance of the May-fly on the Colne that year. The whole scene around the beautiful and hospitable residence, at which I was staying, was the most animated possible. Myriads of May-flies surrounded me, playing in the sun-beams, fish rose in every direction, and swallows hawked up and down the river, and round and round its banks, till they were glutted with food. Nothing is more beautiful and elegant than the motions of May-flies as they flit about on a fine morning in May. Sometimes they dart and strike at each other, and then play up and down in the sun-beams, varying all their motions, and seeming to enjoy their new existence.

The shrew mouse (sorex araneus) will attack frogs, probably for the purpose of feeding on them. The frog screams at the time in the most distressing manner. The person who gave me the information covered the two animals over with a flower-pot, but so earnest was the shrew in its attack upon the frog, that even this circumstance at first did not make him desist.

Very minute insects must have a strong migratory instinct implanted in them. I have seen a large bean-field in Oxfordshire covered with Aphides in the course of one night.

An excrescence taken from an oak-tree in Ashted Park, near Leatherhead, was lately sent to me. It was about the size of an egg, and but slightly fixed to the tree. After it had been on my dressing-table a few days, I found the table covered with a great many flies like small winged ants, the wings being very transparent. On touching these flies as they ran about on the table, they immediately put on a semblance of death, which I had never before observed to b the case with any species of fly. The gall was perforated with a great number of small holes, as big as those which might have been made with a pin, and which I had not observed when I first received it. On cutting the gall carefully in two, a great number of small cells were found, some of them empty, and others having a small white maggot in

them. Each cell was round, and perfectly smooth. The external appearance of the gall resembled the bark of the oak. The formation of these galls by so minute an insect, is a curious circumstance in Natural History.

Two instances have been related to me of Herons having been caught with trimmers which have been set for pike. A heron was lately sent to me by the head keeper of Hampton Court Park, which was caught by the beak in a vermin trap. It has been supposed that a light is emitted by herons from their breast, as they stand in the water of an evening waiting for fish. I should like to be assured of the accuracy of this supposition.

I have elsewhere mentioned that the tameness or ferocity of a parent seems to be imparted to the young with life. A *tamed* wild duck, that had been pinioned, reared her young on a pond close to a gentleman's house in Northumberland. These young never shewed any alarm at man, but remained all the winter with other fowls which had been reared under hens in coops. The common water-hen, when long unmolested, becomes very confiding. Its habits and manners are extremely pretty.

I have heard it stated that some grain, either wheat or barley, had been found, a few years ago, in an

earthen vessel of Roman manufacture, dug up at one of the stations of the Roman wall on the borders of Northumberland, and which vegetated when sown. This, if true, is a wonderful example of the preservation of the vital principle of seeds.

Flounders, turbot, and flat fish generally (Pleuronectes) are such slow swimmers, in consequence of their natural formation, that they would become an easy prey to their several enemies if they were not endowed with the following properties:—Both their eyes are on one side of the head; and it is well known, that when they swim, it is in an inclined position, and that their eyes must be then turned uppermost. They also swim close to the bottom of the sea or rivers, and are thus enabled to perceive the approach of danger from above. They also generally move about in the night, lying flat on the ground in the day-time. Their upper part is of a dusky, muddy colour, so that it is not easy to perceive them; and they remain perfectly motionless when danger is apprehended. I have frequently observed this in flounders; and it is not a slight touch which will induce them to move.

I have been informed that a living and healthy toad was lately found in the centre of a large block of millstone grit. This is one of the most curious problems in Natural History.

The chaffinch in Scotland is known among the peasants as the 'drunken sow,' because they have construed its call into the language of 'drink, drink till 'you're *fou*, wee drunken sowie.' In Gloucestershire the hedge sparrow is called 'blue Isaac.'

The love of pigeons for their native home seems to supersede that στοργη or natural affection which most animals shew for their young Pigeons which have for three or four years bred in a confined place, have, on being released, forsaken their young, although requiring all their care, and returned to their original haunts. A pigeon which had been confined and made to pair with another, on being released, forsook him and her two young ones eight days old, in order to return to a former partner. Although flying about in the neighbourhood, she never again came near them.

I am assured, by a person who has often tried the experiment, that though gold and silver fish will shew alarm by dashing about the glass in which they are confined, if he puts his face or hand near them they become calm, and evince much pleasure if he whistles to them. This affords another proof that fish can hear.

Fowls that roost in trees are much later in laying their eggs than those which have been housed and kept warm. Fowls belonging to London bakers begin to lay very early, as they generally roost over the ovens. Warmth, therefore, seems to be necessary to

the early production of eggs, and it might be worth enquiry whether those birds which are most exposed to cold in a wild state, do not begin the process of incubation at a later period than those which are kept warm. Pigeons are impatient of cold, and they are early breeders.

Every thing almost which Mr. White has written interests me. In looking over his several volumes of manuscripts, I find the following names given to the notes, calls, and sounds made by various birds and insects ;—

The Nuthatch, chatters.
Woodlark, whispers.
Bunting, sings.
Ring-Dove, crows.
Green Woodpecker, laughs.
Tit-Mouse, chirps.
Goldfinch, whistles.
Stone-curlew, clamours, cries.
Greenfinch, chirps.
Grasshopper-Lark, whispers, chirps.
Snipes, pipe.
Goat-sucker, chatters, jars.
Mole-cricket, churs.
Cuckoo, sings, cries.
Swallows, whistle.
Hedge-Sparrow, pipes in winter.
Wryneck, pipes.
Field-Cricket, shrills, cries, sings, crinks.

Water Wagtail, chirps.
Wren, laughs.
Willow Wren, makes a stammering noise.
Hogs, batten on beech mast.
Sewell, applied to the feathers tied to a string to keep deer from breaking ground.

It is a well-ascertained fact, that if a cow produces twins, one of which is a male, and the other a female, the latter is never known to breed. She is called a Free-martin. The farmers about me say that they fatten kindly.

I observe fish sometimes move their fins with great rapidity, and make short darts in the water, and then renew the movement of their fins, like a hawk hovering in the air: they thus support themselves in any depth of water. When the fins are drawn in, the fish sinks to the bottom.

Craw-fish are preserved in tanks, in great quantities, by a fisherman at Hampton Court. They breed freely in these tanks; but the young escape through the holes, though they keep much in the immediate neighbourhood of the place. They cast their shells annually; and if one of the claws or horns is broken off, it is reproduced.

Some of the Thames fishermen are of opinion that gudgeons go to the brackish water of the river to breed. They account for the annual diminution of

their numbers from the circumstance of the water being affected by deposits from the various gas-works of the metropolis. They attribute to this cause the very few eels which are now caught. During the last spring, the annual migration of eels from the Nore did not take place.

Bleak now and then show great restlessness, and come to the surface of the water, making sudden darts, and sometimes swimming round in circles. The Thames fishermen call these 'mad bleak.' I have generally observed these *freaks* to take place in a hot day, with little wind.

Mr. Marshall caught a trout, near Shepperton, which weighed sixteen pounds. That most expert and amiable disciple of Izaak Walton had hooked it a day or two before in trolling, with ten or twelve hooks to his line, which the fish broke. On landing it, (which, by the bye, took him forty minutes to do,) the first set of hooks was found in its mouth. Mr. Marshall tells me that he has frequently caught fish with hooks in their mouths. This seems to prove how very little fish are susceptible of pain in that organ.

No reason seems yet to have been assigned for the use of the two *feelers*, or whatever they may be called, which are found on each side of the mouth of the barbel and gudgeon. Mr. Yarrell thinks that these appendages are delicate organs of touch, by which they are enabled to ascertain, to a certain extent, the

qualities of the various substances with which they are brought in contact, and are analogous in function to the beak, with its distribution of nerves, amongst certain wading and swimming birds, which probe for food beyond their sight; and may be considered another instance, among the many beautiful provisions of Nature, by which, in the case of fishes feeding at great depths, where light is deficient, compensation is made for consequent imperfect vision.

If the leaves of trees are very late in making their appearance, I observe that cockchaffers do not leave the ground at the usual time, but remain buried till food is to be had. This instinct is very extraordinary. It has been suggested that the backward season equally retards both, but I do not think that this is the case, as I have found cockchaffers in a perfect state on a fine balmy day, just below the surface of turf, when no leaves were on the trees.

An owl had, for a vast number of years, frequented a hole in the wall of a house at Tidestone, in Glamorganshire. On repairing the house, this hole was stopped up; but the owl was in consequence so clamorous, that the inhabitants had no peace till the hole was again opened. This bird was generally supposed to have occupied the hole for many years.

I hear of a hive of bees on the top of a house in the middle of Holborn, which is doing very well. The circumstance of bees finding their way home

through the thick smoke, fogs, and vapours of the metropolis, seems to prove that their course is not directed by sight, but by some still unexplained instinct.

I have had three hornets' nests, at different times, in some empty bee-hives. The female begins by making a strong stalk, which she fixes to the top of the inside of the hive, and then forms a sort of cap, worked from dry, decayed wood. In this cap she makes at first only three or four cells, which are subsequently increased in size and number, till all her eggs have been deposited. I put a female hornet under a wine-glass on my table, from which she nearly escaped by getting her feet under the edge of the glass, and then raising it up. Their strength is very great, and they will fly away with a piece of pear bigger than themselves.

Some ducks, the peculiar species of which I have not yet been able to ascertain, were sent from Lincolnshire to a friend of mine, who turned them into the water in St. James's Park. They were at first very shy, and hid themselves amongst the shrubs on the islands. On being driven away, they dived, and could continue seven minutes under the water: one of them remained so long, that he was drowned. Fear must have predominated in this bird over everything else, till the last moment of its existence.

Some persons suppose that the sight of the salmon is as acute as that of the eagle.

Squirrels not only feed on the cones of fir-trees, but gnaw the tops of the leading shoots.

Swallows are eaten in Italy, and are sold in the markets.

It is a general idea, amongst country people, that if there is a good nut year, there is generally a good year for wheat. This, however, is not the case in the present season, as there are but very few walnuts, and the wheat crop is very good. Virgil alludes to this circumstance:—

> 'Contemplator item, cum se nux plurima silvis
> 'Induet in florem, et ramos curvabit olentes;
> 'Si superant fœtus, pariter frumenta sequentur,
> 'Magnaque cum magno veniet tritura calore.'

Young monkies, who never saw, in all probability, wasps, will avoid them with evident fear, when they first come near them.

Horses will sometimes show resentment of injuries. I went to see a fine hunter, who appeared perfectly docile when I went up to him. This his owner did not dare to do; and when he came into the stable, the noble animal was quite furious. He had been ill-treated by his master, who had frequently beaten him severely when there was no occasion for it. The groom exhibited much feeling when he told me this.

Tortoises are known to live to a great age. There is the shell of one of these animals in the library at Lambeth Palace, brought to that place by Archbishop Laud in 1633, which lived till the year 1753, when it was killed by the cold weather. A labourer in the garden dug it up from its winter retreat, and neglecting to replace it, a frosty night, as is supposed, killed it.

Another tortoise was put in the garden of the Bishop of London's palace at Fulham in 1628. This died a natural death in 1754. The ages of these tortoises were not known when they were first placed in the gardens.

'I am one
'Who love the greenwood bank and lowing herd,
'The russet prize, the lowly peasant's life,
'Season'd with sweet content."—ANONYMOUS.

I HAVE more than once in these papers referred to some notes which I have been accustomed to make of remarkable seasons and natural incidents. On looking over my notices of the summer of 1818, they appeared to me sufficiently interesting to be worth transcribing; and I have therefore given them as I wrote them down at the time, with some few additional remarks.

July 13*th*, 1818.—The spring and summer of this year have been unusually fine. On the 14th of April the first hive of bees I could hear of swarmed.

About the 30*th* of *June*, the lime-trees were in blossom.

On the 1*st* of *July*, the grapes against my garden-wall were as big as peas; and on the 8*th* of that month, wheat in the neighbourhood of London was generally reaped. The country was parched to the greatest degree. The crops of grass have been so light, that hay was sold this month as high as nine guineas a load.

July 25th.—The thermometer this day stood in the shade, during the greater part of the day, at 92°, and in the sun at 116°.

July 12th.—Wheat of the year was brought into the Reading market.

July 26th.—Flowers of every description have entirely disappeared. The ground continues parched to a degree seldom known in this country. Cows are generally fed upon hay. Insects are not very plentiful, and I have only seen one wasp this year. Some rain fell for a short time this evening. As soon as this happened, I observed vast quantities of swallows flying over the river Thames, and continuing to do so till the rain ceased, when not one was to be seen.

July 27th.—The leaves of the lime-trees and horse chestnuts are falling, and trees generally have a very autumnal appearance.

July 29th.—Bees almost entirely confine themselves to their hives during the finest days of the latter part of this month, owing to the want of flowers.

August 25th.—The dry weather still continues. It began early in May, and we have been without rain, with the exception of two or three showers, since that time.

September 1st.—Partridges are in greater abundance than has been known for many years past; but they are very wild, owing to the want of shelter, as there are no turnips, and the stubbles have been generally cut, in consequence of the dearness and scarcity of straw.

September 3rd.—Owing to the dry weather, potatoes are dear and scarce, and they have been selling for as much as apples, which are plentiful. Onions also are so dear, that they have sold for as much (in Covent-Garden market) as inferior peaches.

September 6th.—There has been a fall of rain, which seems likely to continue.

December 13th.—The weather has continued almost invariably fine and mild. Violets are in great abundance. Lilacs and many other shrubs are putting out their leaves. Two Glastonbury thorns are now in full blossom at this place, and the nasturtiums are still growing, and do not appear to have suffered from frost, though perhaps they are the first plants which feel its effects.

December 14th.—Blackbirds and thrushes sing morning and evening, as in spring. Turnips, which late in the autumn were so unpromising, are now a fine crop, especially on light lands.

December 16th.—A *pyrus spectabilis* is in full

blossom in a garden at Putney, and also a Glastonbury thorn, The dwarf dog-rose also blossoms, as well as the single anemony. I also hear of violets, both white and red, having blossomed freely in Essex.

December 17th.—It froze rather severely last night. Large flocks of the small wild blue pigeon have appeared on the Sussex coasts, and many of them have been shot near Brighton, generally about eight o'clock in the morning. May was sold this day in full blossom by a countryman on Westminster bridge.

December 20th.—This day I saw sparrows busily employed in building their nests.

December 22nd.—A severe frost appears to have set in, and the fog is the thickest we have had in this country for many years.

Those who recollect the very extraordinary seasons of the year I have referred to will not be at any loss in calling to mind many of the circumstances above mentioned. The summer, however, of 1822 was perhaps still more extraordinary. The following are a few of the remarks I made in the course of that year.

1822.—Winter uncommonly mild. Many spring flowers were in full blossom in February.

March 2nd.—Saw a sycamore-tree nearly in full leaf, and a butterfly the same day.

March 20th.—Heard of bees swarming the beginning of this month.

March 28th.—A swarm of bees settled in a garden near Kingston-on-Thames.

March 31st.—Saw the first swallow; heard the cuckoo also this day.

June 25th.—Harvest begun in many parts of England.

June 30th.—Corn brought to market. Apricots, plums, and some sorts of apples, ripe.

July 5th.—A great deal of corn has been cut and carried. Lime-trees quite out of blossom. I observe but few swallows in our neighbourhood this year. Grapes are in great abundance against the walls, and are very forward.

August 15th.—Dry weather has continued for some months. Out-of-door grapes are ripe. Leaves fall as if late in the autumn. Walnuts ripe.

August 18th.—Swallows congregate.

Though these trifling remarks may not be entirely without interest, especially to those who keep an account of, and take a pleasure in comparing one season with another, they may serve as a specimen to others of the way in which occasional notices may be made of the weather, and different circumstances connected with natural history. I will venture to say that no one who ever took the trouble to do it, thought his time ill bestowed, or looked over his remarks without deriving pleasure from their perusal.

The enjoyments and delights of a country life have been sung by poets in all ages, and it is our own fault if we find the country irksome, or less agreeable than a crowded metropolis. It offers many resources of a most agreeable nature, to those who seek for rational and tranquil enjoyments. A beautiful prospect, a walk by the side of a river in fine weather, or the agreeable shade of a wood or cool valley, have great charms for those who are fond of the country. We may then exclaim with Virgil—

'O! qui me gelidis in vallibus Hæmi
'Sistat, et ingenti ramorum protegat umbrâ"

'The byrdes that fly abroade, do love their owne nestes. The
'beastes that ronne astraye, seketh their accustomed cowches.
'And the fyshes within the water, resorteth to their hollow
'dennes.'—LELAND.

THERE is no writer on natural history, who gives me more pleasure and information than Blumenbach, or who says so much in a few words. Almost all his remarks on the animal creation carry conviction with them, and some of them are so curious that I am tempted to make a few extracts, which will not be unacceptable to those who have not met with his 'Manual of the Elements of Natural History.'

Ourang-outang (*Satyrus*).—Camper has proved by dissection, that it is not capable either of speech or of walking naturally in an upright posture. It is not numerous; whilst the human species, amounting to about a thousand millions, is the largest among mammiferous animals.

Coaita (*Cercopithecus Paniscus*).—Extremely dexterous in the use of its long prehensile tail. The singular manner in which they hang together, so as to form a chain, for the purpose of swinging themselves from one tree to another, on the opposite banks of a river, is represented in the original edition of Ulloa's Viage, &c.

Dormouse (*Glis Avellanarius*).—For its winter sleep it prepares a globular and tolerably solid nest of the needle-shaped leaves of the fir, in which it conceals itself.

Economic Rat (*Mus Œconomus*).—Remarkable for the emigrations which it makes, principally from Kamtschatka, like the lemming in certain years; but still more so, for the industry with which it collects large quantities of roots in its burrows, which are plundered by the Tungoosés, &c., in the same manner as the stores of the hamster by the inhabitants of Thuringia.

Black Rat (*Mus Rattus*).—Extremely voracious. It eats even scorpions, and follows man and his provisions everywhere, into the deepest mines, as well as into his ships.

The Marmot (*Marmota Alpina*). It is occasionally met with on the Allée Blanche, in Savoy, upon isolated rocks, which project like islands from the sea of ice, at the distance of some leagues from any part that is not frozen, and not free from snow for more than six weeks in the whole year; so that it would appear that the marmot, in such situations, must sleep at least ten months in the year, and pass an extremely small part of its existence in a waking state.

The Hamster (*Marmota cricetus*).—Lives chiefly

on corn and beans, of which it carries large quantities, in its cheek-pouches, to its subterraneous burrows, sometimes seven feet deep. A hole of this kind will contain sixty pounds of such provisions. It increases rapidly, and in the district of Gotha alone, as many as ninety thousand hamsters have been killed in one summer.

The Hedgehog (*Erinaceus Europæus*).—A nocturnal animal—feeds both on animals and vegetables—mouses like a cat—can eat cantharides in great quantity. It sticks its prickles into fruit, for the purpose of bringing them to its holes, a fact I have been assured of by three credible witnesses.

The Elephant (*Elephas*).—The young one sucks with the mouth, and not with the trunk, as many have asserted. It is probable that the elephant will live two hundred years. Its step consists in a quick, shuffling motion of the legs, but is so sure, that it never stumbles, even on the worst roads.

The Seal (*Phoca vitulina*).—On dissecting the eye of a seal, I found a remarkable deposition through which the animal is enabled to elongate or shorten the axis of the organ at pleasure, and by that means to see equally well in two media of very different density, viz water and air.

The Duck-billed animal (*Ornithorhynchus paradoxus*).—This extraordinary creature is distinguished

from all mammiferous animals yet known, by the unprecedented formation of its jaws, which resemble, in the closest possible manner, the broad, flat bill of a duck—are covered in the same way with a soft membrane, plentifully supplied with nerves for the purpose of tasting—and also, like it, serrated at the lateral edges. The feet are provided with webs, which in the front ones project beyond the claws, and can by that means be folded up or expanded, like a fan, No appearance of teats has been hitherto detected in either sex. This wonderful animal lives near the lakes about Botany Bay, in the fifth part of the world, so rich in creatures of remarkable formations.

The Redwing (*Turdus Iliacus*).—It smooths its nest with clay and rotten wood; and as the latter shines in the dark, it is possible that a mistake may have given rise to the idea of the ancients of an '*avis Hercynia noctu lucens*.'

Cross-bill (*Loxia gregaria*).—Found at the Cape, where many hundreds together build their nests on a single tree, and cover the singular edifice with a common overhanging roof.

The Snow-bunting (*Emberiza nivalis*).—It is the only living creature that is found at the height of two thousand feet above the limit of perpetual snow.

Titmouse (*Parus*).—It has been remarked of this

and other species of this genus which remain with us in the winter, that during that season the bill becomes harder than in summer, and is consequently better suited for taking their food from the frozen ground.

The Salangane (*Hirundo esculenta*).—It builds the celebrated Indian nests, the materials of which resemble isinglass, in holes on shores and hills. At least four millions of these nests are collected annually, and mostly exported to China.

The Night Jar (*Caprimulgus Europæus*).—A nocturnal animal. It makes a purring noise in flying. It lives on insects, particularly moths. The old tale that it sucks the milk of goats is wholly unfounded.

The Stormy Petrel (*Procellaria pelagica*).—The inhabitants of the Feroe Islands use them as lamps, they pass a wick through their bodies, which, when lighted, burns a long time, from the quantity of fat they contain.

The Gannet—Solan Goose (*Pelecanus bassanus*).—is the principal food of the poor islanders of St. Kilda, whose women wear the skin instead of shoes, which only last about five days, but are immediately replaced by others.

The Stork (*Ardea ciconia*).—It lives not only on amphibia, but also destroys useful animals—whole

broods of partridges, for instance. It frequently carries linen, thread, &c. to its nest, for the purpose of lining it.

Amphibia.—They can endure for a time the extremes of heat and cold. For example, there are undoubted proofs of newts and frogs having lived in the stomachs and intestines of human beings; and of their having recovered, after being frozen perfectly hard.

Many amphibia, when in a state of captivity, do not take any food, but can fast for an astonishing length of time. I have often kept salamanders for eight months together without food, and yet they did not appear materially reduced. As to tortoises, it is known that they can exist full a year and a half without eating.

There is a great tenacity of life in amphibia Frogs are known to leap about after the heart has been torn out; and tortoises to live for months after the brain has been removed. The tails of newts blind-worms, &c., have the power of motion after they have been separated from the bodies.

Many amphibia, particularly among serpents, do not deposit the egg until such time as the young animal contained in it is nearly perfect. The Pipa hatches its eggs on its back. The male places the spawn, which the female lays in the usual manner, on her back. The ova grow, as it were, in the substance of the skin of the mother, until at the end of nearly three months, the tadpoles, which at first have

tails, have arrived at their full period; and the tail having been replaced by four feet, they quit the mother's back.

Toad (*Rana bufo*).—There is no truth in the assertion that it is poisonous. On the other hand, it is indisputable that living toads have been found in sawing through blocks of stone, trees, &c.

Tree Frog (*Rana arborea*).—The clammy slime with which it is covered, like serpents, serves to support it among the leaves of the trees, in which it lives. In croaking, they expand the throat like a large bladder.

Gecko-Lacerta.—It has a poisonous fluid between its scaly toes, which it communicates to the eatables over which it passes.

Chætodon rostratus.—A fish found in the East Indies. Its upper jaw ends in a tube, through which the fish throws water on the insects upon aquatic plants, so that they fall, and become its prey.

The Sucking-fish (*Remora*).—This singular animal can attach itself most firmly, by means of the grooves on the back part of its head, to ships, sharks, &c. Hence the fable, that it was able to stop a ship in full sail.

The Miller's Thumb (*Cottus gobio*).—The female

deposits her spawn in a hole, and watches it until the young ones are hatched.

GENERAL OBSERVATIONS.

Many plants, common duckweed, for example, are not firmly attached to the ground by their roots, but can change their situation at certain seasons of the year, sinking at one time to the bottom, and at others coming to the surface of the water.

The peculiar effect which some climates produce on organized bodies, particularly animals, is very singular. In Syria, for example, the cats, rabbits, and goats, have extraordinarily long white hair; in Corsica, the horses and dogs are spotted in a peculiar manner. In Guinea, the men, dogs, and fowls, became negroes in their different ways.

Nearly the whole of the eye of a water-newt (*lacerta palustris*) was extirpated, all the humours were evacuated, and four-fifths of the membranes cut away; notwithstanding which, within ten months a perfect new eye was formed, with cornea, pupils, lens, &c.

The general purpose of rumination, as applicable to all the animals which chew the cud, appears to be still unknown.

Whole nations are enabled to supply nearly all their most urgent necessities with a single species of mammiferous animals: the Greenlanders with the

seal—the Laplanders, Tunguses, &c. with the rein-deer; the Aleutians, with the whale.

The skeletons of fishes which are found generally very well preserved in the schist of Mount Volca, near Verona, can in general be very positively referred to known species. It is remarkable that this mountain should form a common receptacle, not only for fresh water, but also for sea, fish, and that the latter should comprise creatures from the most remote parts of the ocean, from Otaheite as well as from the Mediterranean, from the coasts of Japan, Brazil, the north east of America, from Africa, &c.

The Academical Museum of Gottingen contains a step of a miner's ladder, found in a mine in the Rammelsberg, on the Hartz, which had been abandoned at least one hundred years, and on which is deposited a collection of drusy crystals seven inches in diameter, and of exceeding splendour.

MISCELLANEOUS OBSERVATIONS.

There can be no doubt, I think, that nothing but the cruelty of man has produced any fear of him in animals. When islands have been discovered for the first time, in which no human being has previously placed his foot, the birds have shewn no symptoms whatever of fear. Many instances have occurred which even shew that animals have fled to man for protection. A gentleman of my acquaintance, while walking by the side of a public road, was surprized at a partridge alighting between his legs. It had been pursued by a hawk, and had taken this mode of preserving itself from its attack. It remained near to its protector for some time, and when the hawk had disappeared, quietly crept into the hedge. So great is the eagerness of hawks, when in pursuit of their prey, that a person who has a cage of canary birds, which are generally kept at a window, has twice had it broken by hawks darting at the birds: in both cases the hawks were taken. Another of these birds killed itself by striking against one of the panes of glass of the conservatory of the royal lodge, in Windsor Great Park, while endeavouring to seize a robin which had accidentally got into it.

The following instance of the maternal anxiety and sagacity of a hen is worth recording. In consequence of some heavy rains, nearly all the ground

about a poultry yard was covered with water. At this time there was a brood of young chickens in the hen-house; they were on the roosting place, and would not get down in consequence of the water. In this situation they remained nearly two days, at the end of which time the hen was seen to convey them, one by one, on her back, to the grass plot at a short distance, wading through the water as well as she could. In this way the chickens were saved from being either starved or drowned.

Persons who breed canary birds have many opportunities of watching their peculiar dispositions, and there appears to be as great a variety in their tempers, as amongst human beings. The mate of a canary bird which was sitting on her eggs, was more intent on serenading than feeding her. When this was the case, she would quit her nest and chase him round and round the cage, pecking him violently with her beak, and shewing her anger in a variety of ways. She would then return to her nest without attempting to feed herself, and the male would then, like a meek, obedient husband, immediately attend to her wants, carrying her a plentiful supply of seed, groundsell, and egg. He then resumed his song, and she resumed her discipline whenever his notes were too much prolonged.

Swallows appear to perform their migrations very high in the air, probably because the currents of wind are there stronger.

Young swallows will settle on grass-plots to catch insects. In doing this, their motions are as quick as those of the water wag-tail.

The gastric juice of the carnivorous and graminivorous feeder of one cavity, is acid; of an omnivorous feeder, neutral; and in a ruminating animal, with four cavities, it is alkaline.

A friend of mine once witnessed the manner in which a weazel conveyed an hen's egg to its retreat, This was done by rolling it along with its nose, and which the animal appeared to do with great care, that it might not break it.

So eagerly do the Thames flounders sometimes follow the minnows, and other small fish, for the purpose of feeding upon them, that they are frequently seen in the shallows and at the edge of the water in pursuit of them.

In decoy ponds, during a hard frost, the decoy men are employed all night to break the ice ready for the ducks when they return from the sea which they do very early in the morning. But for this precaution, the ducks would leave the pond. The men know to a few minutes when the ducks will alight, and get out of their sight accordingly. They come in what are called bunches, and sometimes there will be as many as 150 ducks in a bunch. Their sense of smelling is very acute.

There are some counties in England in which wagtails are never seen during the winter. This would show that they make partial migrations.

An oak-tree planted in 1720, measured in 1790 at one foot from the ground, twelve feet six inches. The mode of planting now adopted in the New Forest causes the oak to thrive very rapidly.

The difference in the materials used by wasps and hornets in forming their nests appears to be this. Wasps *rasp* off particles from sound wood, while hornets use decayed wood. These particles probably undergo some change in the stomach of the insects.

When the wood-lark sings, it sometimes hovers, and takes extensive circuits round in the air at a great distance from the ground. Its motions then are very pleasing,—

> 'While high in air, and pois'd upon its wings,
> 'Unseen the soft, enamour'd wood-lark sings.'

Woodlarks are said to sing during the night in summer in the air.

I often observe that martins late in the autumn cling against walls; what their object can be I know not, except it is to look for insects in the walls, and this seems contrary to their natural habits.

I always listen with pleasure to the remarks made

by country people on the habits of animals. A countryman was shown Gainsborough's celebrated picture of the Pigs. 'To be sure,' said he, 'they be 'deadly like pigs, but there is one fault; nobody 'ever saw three pigs feeding together, but what 'one on'um had a foot in the trough.'

June 25.—A fisherman came this day to tell me that he had caught in his net while pushing off the water gallery in the river Thames, opposite Hampton Court Palace, a fish which he had never seen before. On going to look at it, I found it was the Allice of Pennant, and the Clupea finta of authors. On taking it out of the well of the boat, it was full of spawn, and it died in my hand. It weighed almost four pounds, and had the most beautiful silvery hues I had ever seen. None of the old Thames fishermen in my neighbourhood had ever seen one before, and its appearance therefore in that part of the Thames must have been unusual. It may now be seen in the British Museum.

It is a curious fact, that when young partridges are hatched and have left the nest, the two portions of each shell will be found placed in each other, and I believe that this is invariably the case. This is probably done by the chicks themselves in their last successful effort to escape from prison.

Some years ago a pair of hoopoes built their nest and hatched their young in a tree close to the house

at Woodend near Chichester. This is the only instance I have met with of these birds breeding in this country.

Abilities which have been acquired artificially, and which have been kept up by practice throughout successive generations, may finally be propagated as natural propensities. I had a young pointer which found and pointed at game the first time he was taken into a field. The descendants of a breed of terriers I have had many years, all shew their teeth and put out their paw when they are caressed. This is a peculiarity of the breed. Young South Sea Islanders are said to be able to swim when first put into the water.

Hawks appear to be migratory and gregarious. During the late war, while the Nymph frigate was employed to blockade the port of Boston, a large quantity of hawks settled on the rigging. The ship was then twenty miles from land, and the evening fine. The whole of the rigging was covered with them.

Ear-wigs possess wings. This may easily be ascertained by developing one, after killing it, with a pointed pen-knife. The swallow-like tail will be discovered to be two terminations of wings.

Perhaps dissimilarity in colour between the male and female bird is greater in black grouse than in

any other species, the male being of a fine glossy black, and the female a mellow brown. But for this distinction, how many of the females would be seized by hawks while they were sitting on their eggs. Most birds which sit on the ground have an earthy colour. This is a beautiful fact in the economy of nature.

The habits of herons are singular. A gentleman who has an heronry in his park, informs me that he frequently sees these birds alight on the ground near his house, and walk about in a peculiar manner, not looking for food, but merely parading here and there. I observed a similar circumstance in Richmond Park, where numerous herons sometimes congregate.

I have been assured that when the wind blows steadily from the sea in summer, the common house fly is always observed to be most abundant in houses at Brighton. If, on the contrary, the wind blows from the land, few of them are to be seen.

I like to hear the names given by country people to animals and plants. The ground ivy plant is sometimes called 'Robin-run-in the hedge, and Gill-'creep-by-ground,' and the meadow-saffron, 'Naked 'ladies.'

Walden in Essex got the name of Saffron attached to it from the great quantity of Saffron or autumnal crocus grown there. We have also Saffron hill, probably for the same reason.

Young mackerel are taken in all seasons off Shoreham Harbour. Some of them are only an inch in length, and others vary from three to ten inches, a proof that they spawn at no great distance.

April 7.—I observe that if ever a pair of rooks attempt to build their nest in a tree previously unoccupied—that is in a tree which was never colonized before, the other birds invariably destroy the nest. This is repeatedly the case in the avenues of Hampton Court Park. A clergyman, to whose kindness I am indebted for several pleasing communications, informs me that there was a small rookery in his church-yard. A pair of rooks was observed from an adjoining house to build their isolated nest on a lower branch of one of the trees. This nest, in various stages of completion, was pulled down by the other birds twenty-two times. They at last were suffered to enjoy the nest their indefatigable exertions had, enabled them to complete. This fact would help to prove an interesting circumstance in natural history, namely, that birds have the power of delaying the growth and production of their eggs, as there is no reason to suppose that the number of eggs in the ovarium is indefinite. If it is the case, as there is every reason to suppose, that birds only begin to build their nest when the ovarium enlarges in the spring, the instance which has been related would place the power of retardation beyond a doubt.

The golden-crested wren, may, I think, be classed

amongst our British songsters, I sometimes hear them sing among the old yew-trees in Hampton Court Gardens. The notes are very feeble and have not much variety.

Some pairs of Stock-pigeons (Columba œnas) build every year in the holes of the old oak pollards in Richmond Park. The keepers take the young, which they say are excellent eating.

The English are perhaps the only people in Europe who cannot be admitted freely into public walks, gardens, or buildings, without committing some injury or nuisance. Names are cut on trees or benches, or something or other is mutilated or defaced. It is very different on the continent. The public gardens at Frankfort are only separated from a high road by a single rail, and yet nothing is injured, although no one is excluded. In these gardens, a nightingale had for many years built its nest in a particular spot close to one of the walks. It was seen by every one, and yet no one molested it, until one day a foreign servant saw and took it. When it became known, the man was hunted by a mob, taken before the city authorities, and the fact being proved, he was sentenced to have his coat turned, to be drummed out of the city with every mark of disgrace, and never to enter it again.

We know very little of the habits of the grosbeak or hawfinch (loxia coccothraustes.) It is rather a

scarce bird in this country, and has hitherto generally been considered as only an occasional visitor. Mr. White says that they are rarely seen in England, and only in winter; and Mr. Markwick adds, that he had never seen this rare bird but during the severest cold of the hardest winters. Colonel Montagu speaks of it as visiting England in the autumn, and continuing till the month of April; and he adds, that no instance has been recorded of its breeding with us.

In opposition to these remarks, I can express my conviction, not only that the grosbeak stays with us all the year, but that it breeds in the country. Being a rare bird, it is shot whenever it is seen, for the purpose of being preserved, and sold to collectors; and this circumstance alone would account for so little being known respecting it. The nests of this bird are, however, frequently found amongst the hornbeam pollards in Epping Forest, and the bird may be seen there at all periods of the year. It has also bred for some years past in the grounds of Lord Clifden, at Roehampton, and may be seen there all the year through: at this time (March, 1835) there are two pair of them: and a nest, with four young ones, was taken last summer, and is now in the possession of the lodge keeper, the birds being preserved. The nest was built at the extremity of the branch of an horse chesnut tree, near the lodge, and was composed chiefly of the twigs of the privet and birch, and lined with hair and fine grass. Bewick says it is made of small dry roots, none of which,

however, are to be seen in the nest in question. I should add, that the nest is shallow, and the twigs are loosely put together, something like that of the wood-pigeon. The birds do not appear to be either shy or solitary, as they frequent the neighbourhood of the lodge, where they may be seen almost daily. It does not sing, but has a plaintive note, something like that of the robin. It generally settles on the high dead branches of trees.

Eels sometimes grow to a great size in this country. A sharp-nosed, silver eel, called by the Lincolnshire fishermen "Brawet," was caught in the river Witham, which runs from Lincoln to Boston, about two years ago, which weighed sixty pounds. It measured rather more than six feet in length, and when the skin was stretched out, it was more than three feet across the body at the pectoral fins. The skin is now to be seen at a place called Dag-dyke.

I continue to receive various confirmations of the fact of eels going to the sea to deposit their spawn. A gentleman writes me word, that when he resided at a sea-port in Lincolnshire, he had frequently noticed the migration of young eels from the sea. In the spring, or rather the early part of summer, he observed a dense line of these fish, on each side of a drain, or small river, where he was fishing: the line was about a foot broad and a foot deep, and they were swimming up the drain in countless myriads. Upon enquiry, he found that this dense mass of fish

continued without break or interruption for twelve miles. A similar circumstance occurred yearly in the river Glen, near Spalding, in Lincolnshire; and there is little doubt but that the same thing may be observed in every other drain or river connected with the sea. It seems to place the fact of eels going to the sea to spawn, beyond a doubt: as if they did not do so, the young eels could not retreat from it. It is altogether a curious fact in natural history.

The following circumstance will prove that eels travel over-land:—There was a pond in a garden in Lincolnshire, which was completely unconnected with any other water, and which frequently was perfectly dry; it always, however, had eels in it the following year; these eels were of a large size, from one to two pounds weight; it was very seldom that any small ones were found.

The circumstance that rats, weazels, and pole-cats, should be able to remove eggs without breaking them, to considerable distances, and to places not easy of access, has always been a matter of wonder; the fact, however, cannot be doubted. A gentleman who communicated the occurrence to me, stated that in the village where he resided, a labourer was directed by his master to take down some tables and other things used in the making of bricks, from the top of an old brick clamp, where they had been stowed away and covered with straw. In this operation he disturbed a couple of pole-cats, or foul-marts,

which had taken possession of this asylum: they were both killed, and in their retreat the man discovered a quantity of geese, ducks' and hens' eggs, and also the eggs of plovers, all whole, and all of which these animals must have conveyed to the top of the clamp, to the height of about twelve feet.

Many persons still doubt the fact of toads having been found alive in solid blocks of stone. I do not pretend to account for the circumstance, but it is too well authenticated to be now disputed. Some quarry-men were quarrying sand-stone rocks near Caermarthen, in South Wales, and at different times found three small toads alive in the solid rock. A gentleman in the neighbourhood saw the reptiles, and vouches for the fact. In further proof, I may mention, that a frog was dug out alive from a stratum of stiff clay, near Tunbridge Wells, very recently; it was about seven feet from the surface; the owner of the estate happened to be standing close to his workmen at the moment, and saw it dug out. It was carefully taken away, and he brought it to his house in Great Cumberland Street, London, where he shewed it to many of his friends. It lived some weeks, but refused all food, and was at last killed by an accident.

Swineshead Abbey, in Lincolnshire, is famous in history as the scene of poisoning King John. An old elm tree, in the avenue leading up to the house, was blown down by a high wind; several young jack-

daws were killed in their nests in the hollow tree when it fell; one, however, escaped, and was reared by the children. This bird evinced great sagacity, but there was one circumstance attending it which excited particular observation. When the owner of the house was riding out, the bird appeared to be always watching his return; and the moment he saw him coming up the avenue, he would fly off in search of the groom, and, by his extraordinary noise, apprize him of his master's approach. If the man did not attend to him, he would peck at his legs, lay hold of his stocking, and pull with all his might; and the man said he was always made sensible of his master's return, by the peculiar note of the bird. It used to take its stand upon the gate of the stable yard, which commanded a view down the avenue. Like most pets, it came to an untimely end. The poor bird alighted amongst some hot ashes, and was burnt to death.

A gentleman residing in South America had a boa constrictor sent him, which was killed on the plains of Apure, in that country: it required one hundred pounds weight of cotton to stuff the skin; it measured twenty-two feet in length, and at the thickest part of the body it was two feet in circumference. The name which this colossal reptile goes by in Venezuela, is that of 'La Culèbra de Agua,' or water serpent; it is also called the deer swallower: it is not venomous, nor known to injure man, but the natives of the plains stand in great fear of it, never bathing in the waters wherein it is known to exist. Its com-

mon haunt, or rather domicile, is invariably near lakes, swamps and rivers, and close to the wet ravines produced from inundations of the periodical rains; hence from its aquatic habits it derives its first appellation. Fish, and those animals that repair thither to drink, are the objects of its prey. The creature lurks watchfully under cover of the water, and whilst an unsuspecting animal is drinking, suddenly makes a dash at its nose, and with a grip of its back-reclining, double range of teeth, never fails to secure the terrified beast beyond the power of escape. In an instant the sluggish waters are in turbulence, and foam; the whole form of the culèbra is in motion; its huge and rapid coilings soon encircle the struggling victim, and but a short moment elapses ere every bone is broken in the writhing body of the expiring prey. On ceasing to exist, the reptile's tongue is then protruded (taking a long and thinner form) passing over the whole of the lifeless beast, leaving on it a sort of glutinous saliva which escapes from glands inside the mouth, and greatly facilitates the act of swallowing, which it performs gradually, by gulping it down through its extended jaws. It possesses a power of extending them to such a frightful and extraordinary degree as not to be believed, when looking at the comparative smallness of the mouth and throat in their tranquil state. After having completely devoured, or rather hidden its prey in the way described, it becomes powerless as to motion, and remains in an almost torpid state for some days, or until nature silently digests the swallowed animal. The

flesh of this serpent is white, and abundant in fat. The people of the plains never eat it, but make use of the fat as a remedy for rheumatic pains, ruptures, strains, &c. When these creatures are young, the colours on the skin are very bright, and gradually lose their brilliancy with age. The skin of the serpent in question has been sent to the United Service Museum.

A gentleman living near Spilsby, in Lincolnshire, was one day riding over his farm and superintending his plough-men, who were ploughing a piece of fallow land. He saw a partridge glide off her nest, so near the foot of one of the plough-horses, that he thought the eggs must be crushed; this, however, was not the case, but he found that the old bird was on the very point of hatching, as several of the eggs were beginning to crack. He saw the old bird return to her nest the instant he left the spot. It was evident that the next round of the plough must bury the eggs and nest in the furrow. His astonishment was great when, returning with the plough, he came to the spot, and saw the nest indeed, but the eggs and bird were gone. An idea struck him that she had removed her eggs; and he found her, before he left the field, sitting under the hedge upon twenty-one eggs, and she brought up nineteen birds. The round of ploughing had occupied about twenty minutes, in which time she (probably assisted by the cock-bird) had removed the twenty-one eggs to a distance of about forty yards.

A farmer in Somersetshire has adopted a new method of destroying moles. At day-break he sallies forth with his gun in his hand, for then, and at two or three o'clock in the afternoon, is the time when the mole roots up the earth. The moment he sees the earth beginning to rise, he fires at it, and so successful has he been, that lately, out of twenty-six shots, he killed twenty-one moles.

Some poachers have lately found out a new method of facilitating the capture of hares. They merely lay their nets at some particular gate or stile, or at some hare-run in the hedge, and then go round to all the other gaps and runs in the hedges and whiff tobacco over them. So delicate is the smell of the hare, that she will not pass through where the tobacco has been, and of course chooses an egress free from taint, where there is sure to be a net or wire, and thus she is caught.

The following is an instance of the sensibility, if I may call it so, of a horse, and proves how alive he is to danger. A friend of mine was riding a horse one day in India, attended by a spaniel dog, who had long been its companion. The dog ran into some long grass, and came out crying and shaking its head: the horse, contrary to his usual custom, not only avoided the dog, but shewed the utmost dread of its coming near him: the dog soon died, and, upon examining him, it was found that he had been bitten in the tongue by a venomous snake.

The bill of the toucan is out of all proportion to the size of the body of the bird. In fact it appears an enormous excrescence, equally unwieldy and useless. This, however, is not the case. In endeavouring to ascertain the utility of the long beak of the toucan we must refer to its food, the means of procuring it, the enemies it has to encounter, and the peculiar habits of the various animals of the country in which it is found. The toucan, like the woodpecker, deposits its eggs in holes of trees. The bird itself, as well as its eggs, would become the prey of the numerous monkies which inhabit the country if it had not so large a bill to defend itself. The toucan feeds much on the eggs of other birds. By means of its long bill, it is enabled to search for and reach them in the holes of trees, and also in the pendent nests of tropical birds. These nests are suspended from the extremity of branches of trees, as a security against monkies, and have a hole in the side, into which the toucan is enabled to thrust its long bill. It is evident that this powerful bill is not required to break the food, since the bird seizes fruit or eggs at the extremity of it, and, by throwing back the head, deposits the food in its throat at once. We thus see, that what at first appears a deformity, is, on the contrary, a kind and useful provision of Nature to enable the bird both to feed and defend itself.

When cuckoos first arrive in the spring, and before libellulæ, and other insects are abundant, they may be seen searching for food in meadows and grass-fields.

In doing this their motions are very similar to those of the starling. On dissecting the stomach of a female cuckoo, numerous small snail-shells were found in it. The ovary contained the rudiments of five or six eggs. The female cuckoo seldom utters any cry. The neck of the male is much distended during the breeding season. There can, I think, be no doubt but that the female has the power of retaining her egg until she has found a fit nest to deposit it in.

It is, perhaps, not generally known that the red-legged partridge (perdrix rufa) does not always deposit its eggs on the ground, as is the case with the common partridge. A pair of the red-legged partridges have for several years past had their nest, and hatched their young, amongst the thatch of a hay-rick in the stack-yard of a clergyman in Norfolk. He informs me that this is a circumstance of no unfrequent occurrence where these birds abound.

The force of natural affection for their young is more strongly shewn in some animals than it is in others of the same species. A farmer discovered a partridge sitting on its eggs in a grass-field. The bird allowed him to pass his hand frequently down its back without moving, or shewing any fear; but if he offered to touch the eggs, the poor bird immediately pecked his hand. Several persons went to see the bird, and a friend of mine, amongst others, who informed me of the circumstance. When we consider the timid nature of the bird, it is not a little surprizing

that a partridge should have braved every danger sooner than forsake its yet unhatched young.

Mr. Knight, the intelligent nurseryman in the King's-road, Chelsea, who has done so much in introducing new and beautiful plants into this country, keeps a large number of toads in his stoves, as he finds them beneficial in destroying wood lice, which injure his plants. The heat in some of the stoves, on the first of August, was 130, (shewing how capable toads are of enduring great heat as well as extreme cold) and yet the toads did not appear at all affected by it. If an insect was put five or six inches from one of them, it seized it with so much rapidity, that it was difficult to perceive how it disappeared. On one occasion a large toad eat four good sized beetles, one after the other: they were taken up in its forefeet, and when he got them endwise to his mouth, they were swallowed in succession. Toads are harmless animals, and of infinite use in a garden, consuming great numbers of slugs and destructive insects. Toads are certainly capable of attachment, (indeed, what animal is not?) and when they are without fear, their eyes are peculiarly soft and mild in their expression. They are, however, a loathed and persecuted species. Shakspeare characterizes them as 'ugly and venomous,' while Milton, as if to increase the odium against them, assimilates one of the species with the arch enemy of mankind in that fatal transaction—

'Which brought death into the world and all our woes.'

At the ear of Eve, infusing every baneful propensity, Satan is described as 'squat like a toad;' and the descendants of Eve, as if they supposed 'the foul 'fiend' to be in every distinct animal of the genus, seem resolved to wreak their vengeance upon all of them.

I am desirous of rescuing these poor unoffending animals from the cruelty which is so commonly practised upon them. It is impossible to walk through a village without seeing several mummies of toads, sprawling with extended feet, having been beat flat by stones thrown at them by mischievous boys. Gardeners either cut them in two with their spades, or else destroy them in some other way; while every one seems to enjoy the misery which is inflicted on this unfortunate reptile. In short, they are surrounded by enemies, and the whole race would probably become extinct if they left their retreats in the day-time. If people would only bear in mind that animals were created, not out of caprice, but to be useful to man, they would perhaps refrain from wantonly destroying them.

A mole-catcher, employed in Richmond Park, brought to me, this summer (1834), a live mole, having the greater part of the fur on its belly of a beautiful orange colour, and its back mottled with orange. I have now kept it alive some time, and it gradually becomes less timid: it is fed with worms and beetles. Moles are readily tamed, and if kept in a box, with a little dry hay, and regularly fed, will

thrive very well. As soon as a mole is caught and placed in a box, it will begin to feed with the utmost unconcern, probably owing to its under-ground habits, which render it fearless of man.

It is a curious fact, and not, perhaps, generally known, that both the mole and the shrew-mouse will devour frogs. The following circumstances will, I think, prove that they do so. As Sir George Rose was travelling he got out of his carriage as it was dragging slowly through some deep sands to the east of Utrecht, where there is now a fine causeway. Sir George heard a shrill squeak close to him in a half dry ditch to his left, and looking into it, saw a frog struggling to escape from a mole, who had seized it by the loins, and was evidently endeavouring to prey upon it. He killed the mole, and freed its victim. This affords a strong presumption that moles feed on frogs, as they certainly do upon birds.

The following fact will also shew that the shrew-mouse will feed upon frogs. The intelligent and observant foreman of the works in His Majesty's Parks saw a shrew-mouse and a frog struggling together. The former had seized the latter by the neck, while it continued screaming in great distress. He separated them, and then put them both into a flower-pot. In this situation the shrew-mouse again attacked the frog, and after some time killed it, and afterwards eat a part of it. It is a fact well known that no cat will eat a shrew-mouse, and a dog always turns from it with apparent disgust.

So great is the voracity of a mole, that the one I

have at present eat one day a sparrow, with the exception of the head and back-bone, in addition to his usual supply of worms. The next day he devoured the greatest part of a black-bird. The mole, for its size, is a very strong animal. When I have allowed mine to bury itself a little way in the grass plot, it required some force to draw it out again. It works with so much rapidity, that it is impossible to follow the motions of its fore feet. Its neck and snout must possess great muscular power, as it turns up the hardest turf before its feet are used for the purpose.

Hedgehogs, which are, nocturnal animals, and mouse like a cat, will also, like the mole, feed upon frogs, so that of all the tribe of amphibia that animal is perhaps the most generally preyed upon. It has enemies in the adder and snake—and the hawk, owl and crow; and various quadrupeds devour it, as well as pike and eels. When a snake seizes a frog, it makes a most piercing and piteous cry.

'Our plenteous streams a various race supply,
'The bright-eyed perch with fins of various dye;
'The silver eel, in shining volumes roll'd
'The yellow carp, in scales bedropt with gold;
'Swift trouts, diversified with crimson stains,
'And pikes, the tyrants of the watery plains.' POPE.

We know less of the habits of fish than those of any other animals. Every year is, however, producing some little addition to our stock of knowledge; and I am glad to find that Mr. Yarrell is now employed on a work on British Fish, which will be a valuable and interesting addition to our books on Natural History. No one could be found who will do it better.

The variation which different waters produce on the colours of fish is not a little curious. Trout taken out of some waters entirely change their appearance in others, and this, I have no doubt, has given rise to the supposition that there are several varieties of them. I have seen a perch taken out of a chalk-pit, which was nearly white, probably deriving its colour from that of the soil. Pike in muddy ponds have a muddy colour, while those in a clear stream, with a gravelly bottom, are beautifully speckled or mottled. In some waters fish do not grow to any size, however abundant food may be. This is the case in the canals in Hampton Court

Park, where there are many thousands of small perch and few large ones. The bottom of the canal is covered with dead leaves. A lady at Windsor put a small carp, about six inches in length, into a rain-water tub in her yard eighteen years ago. It is now the same size and weight that it was at that time. It eats out of her hand, has plenty of food, and yet does not grow. In some waters carp will not breed. In others they do so abundantly. This is particularly the case in the Sussex ponds, where store carp and tench abound. In one pond in Staffordshire carp bred freely: in another adjoining, they were never known to breed. These facts appear to me to be curious, and worth enquiring into the cause.*

Eels certainly come upon grass lands to feed at night upon worms and snails. In the meadows at Barford, in Warwickshire, they have been cut in two by the mowers, and an old keeper there assured a friend of mine that he had frequently intercepted them on their way back to the river early in the morning. Their movements on land are very quick. In a clear rapid stream eels may sometimes be observed having their tails coiled round a piece of rush or flag, like snakes, the force of the water washing their bodies backwards and forwards. In this position they are prepared to seize upon any prey which

* It is perhaps not generally known that there is a grass growing in ponds and rivers called the 'flote fesue grass,' the seeds of which are very sweet and nourishing. Water-fowl and fish are very fond of them, and trout are said to thrive most in streams where this grass abounds.

comes within their reach, feeding upon aquatic insects, frogs or fish. Eels have been known to fasten even upon large carp, like a bull-dog, and no exertion of the fish can shake them off. An eel will thus attach itself to a carp till it has destroyed it.*

I may here mention that there was no eel fair this spring (1834) in the river Thames. A very few stragglers were observed, but not higher than Teddington. A circumstance of this sort has not occurred for many years. The Thames was, however, unusually low in the spring, and the eels might have made their passage more in the middle of the stream instead of the sides, as has been heretofore the case.

That eels hybernate during the cold months, there can, I think, be little doubt, few or none being caught at that time. I have endeavoured also, but without success, to procure eels in the winter, from those places in the river Thames where I have every reason to believe they go to spawn. I read an account, which, if correct, would serve to prove what I have now stated. A boy at Arthurstown, in the county of Wexford, on the river of Waterford, perceived something of a very unusual appearance floundering upon the sand at low water. Upon a nearer approach he found it to be a quart bottle, which shewed many symptoms of animation. He seized it and brought

* The more rapid the stream is in which eels are found, the better they appear to be both as to condition and colour,—

'The Kennett swift for silver eels renown'd.'

it in. It was found to contain an eel so much thicker than the neck of the bottle, that it must be supposed the eel made its lodgment there when it was younger and of course smaller. It was necessary to break the bottle for the purpose of liberating the fish.

If this account is true, it goes to prove in a curious way, as far as one instance can do so, the propensity which eels have to hybernate during the cold months. It also seems to prove that they do this in the tideway if they can, and that they neither feed or deposit their spawn 'till the season of hybernation is over. It is indeed a general opinion amongst old fishermen that eels cannot bear cold. Leeches, on the contrary, can bear almost the extremes of cold as well as heat. I have known them frozen in a bottle of water, and appear vigorous after the water was thawed. An English officer, who accompanied the French expedition to Algiers, assured me that several of the mules bled to death in consequence of having swallowed leeches in the water they drank, and which fastened on their intestines. The waters in the neighbourhood of that place were so very full of them, that the French soldiers were obliged either to filter it through their handkerchiefs, or to dig holes in the sand by the sides of the streams.

I have frequently observed a chub in the fountain of the Gardens of Hampton Court Palace, roll itself in apparently a playful manner along the bottom of the fountain. It would make a sudden dart, throwing itself upon its back and sides. In doing this, it

was always followed by several small roach and dace, which no doubt fed on the insects which harbour in the mud, and which the chub disturbed.

Perch appear to be a very precocious fish. I have known them full of spawn when they have not been more than three inches in length.

From various experiments which I have tried, there can, I think, be no doubt but that fish have the organs of hearing. Mr. John Hunter was of that opinion, but many people, I believe, still doubt the fact. There is, however, a singular mode of taking trout practised in some of the rivers in South Wales, which would go some way to confirm the supposition. The sides of the rivers are here and there very rocky, and where there is a flat shelving rock, trout generally haunt under it. If this rock is struck forcibly with a large sledge hammer, the trout rise to the surface of the water, appearing as if they were stunned, and are then taken.

The Dutch fishermen who bring live cod in well-boats to the river Thames to supply Billinsgate Market, are in the habit of puncturing the air-bladders of the fish, which they perform with a sharp-pointed instrument, like a shoemaker's awl. By this means the fish sink to the bottom, and remain perfectly quiet during the voyage, so that they do not bruize themselves, and are more closely stowed. Few fish die by the operation. Cod remain so perfectly healthy in brackish water, that I have little doubt, if they were habituated to fresh water by degrees, they might be preserved in ponds for a considerable space

of time. Persons having ponds near the coast of Kent or Essex might easily try the experiment. Fresh water trout are constantly taken in the sea near the mouths of rivers, and I believe occasionally other fresh-water fish, a proof that they can become habituated to salt water.

Every year serves to convince me more and more, that the idea which I ventured, with considerable diffidence, to advance in the first Volume of my Gleanings of the non-migration of gregarious fish, such as mackarel, herrings, pilchards, &c. is a correct one It has been supposed by Pennant, and other able writers on Natural History, that large shoals of herrings leave the neighbourhood of Shetland in June, and surround the Island of Great Britain and Ireland, congregating again off the Landsend in September.—From the united testimony of many intelligent fishermen, and from my own observation, I am convinced that no such migration takes place, but that by a beautiful and benevolent arrangement of Providence, the gregarious fish, which are of such vast utility to man, leave the depths of the sea at certain ordained periods. Each vast shoal is succeeded by another. We have the mackarel, the herring, the sprat, and the pilchard, in regular succession. These fish leave their haunts when they are in the highest perfection, and frequent shallows, where they are readily captured. If they had not been endowed with this impulse, the enormous benefits they are of to mankind

would be lost. Surely the mind of man cannot have a more interesting, or, indeed, a nobler subject for meditation, than the consideration of the ways of Providence in the works of creation.

'When we wander in the spacious fields of imagination and
'probability, many a beautiful thought, many an entertaining
'conjecture, will present itself to a lively fancy, not perhaps
'unworthy the attention of a wise man, or the consideration
'of a philosopher.'

Every one who reflects at all on the subject, must be surprised at that wonderful instinct which leads animals to revisit the same spots which they had quitted many months before, having in the mean time visited regions previously unknown to them and very remote from the place of their birth. This we know to be the case with our own birds of passage, and many well attested instances have been recorded of the same instinct being possessed by the larger animals, such as sheep, dogs, &c. It will be found also, I have reason to think, in man in his most savage and uncultivated state, and if so, we have an interesting subject of enquiry why that instinct should be lost to us when our rational faculties are more cultivated. Take a savage one or two hundred miles from a spot where he has always lived and never quitted before, and turn him loose in a wood or on a plain, and without referring to the sun, moon or stars as guides, or without any assistance whatever, but that unexplained instinct with which he is endowed, he will with little or no deviation find his way directly back to the home from which he had

been taken. A friend of mine not a little remarkable for the vigour and activity both of his mind and body, described to me the horrible sensations he experienced on one occasion, when he had wandered into the woods near his residence in Nova Scotia, and suddenly found he was unable to extricate himself. He ascended trees—he went here and there, and every step he took seemed to plunge him deeper into the recesses of the forest. He told me that he felt like one in the midst of a vast desert, without compass or guide, and perfectly unconscious of the way he should direct his steps. He had nothing but death before him. The recollection of his wife, his children, and his friends, roused him to fresh exertions. But the faculties both of his mind and body became more and more enervated, and he was on the point of yielding to that despair, which on such occasions generally terminates in madness, when a trifling object which he had previously noticed, made him aware of the locality of his situation. He was thus able to find his way home. Under similar circumstances, the instinct possessed by a savage, or by a horse, a dog, a pig, or indeed by any other of the lower animals, would have led them probably in one unerring line to the place which they had been in the habit of frequenting. May we not infer therefore that a beneficent Creator, who watches unceasingly over all his creatures, and who 'tempers the 'storm to the shorn lamb,' has thought proper to endow the poor untutored savage, as well as the beasts of the field, and the birds of the air, with

faculties which he has denied to man in his more rational and cultivated state of being? The most minute of our birds, our tender feeble warblers, even the bee which leaves its hive for the first time and passes through the air, as it is known to do, to collect honey many miles from its home,—

'Steering his distant journey through the skies—'

all these, and many others, possess an instinct so wonderful that we are incapable either of explaining or accounting for it.

I was led into these reflections on receiving an account of the following extraordinary fact in Natural History, which was communicated to me by an officer of rank in the British Army. He informed me that a ship, which touched at the Island of Ascension on her way to England, took in several large turtle, and amongst others, one, which, from some accident, had only three fins. It was in consequence called, and known on board the ship by the name of 'the Lord Nelson.' It was marked in the usual way by having certain initials and numbers burnt upon its under shell with a hot iron, and which marks are known never to be obliterated. Owing to various causes, the ship was a long time on her passage homewards, a circumstance which occasioned many of the turtle to die, and most of the rest were very sickly. This was the case with 'the Lord Nelson,' and it was so nearly dead, when the ship arrived in the channel, that the sailors, with whom it was a favourite, threw it overboard, in order as

they said, to give it *a chance*. Its native element, however, appears to have revived it, for two years afterwards the very same turtle was again taken at its old haunt on the Island of Ascension. The proofs brought forward of the accuracy of the statement, place its authenticity beyond a doubt, and it affords a most extraordinary instance of the wonderful instinct possessed by animals. When we consider the vast track of waters this turtle had to pass through, and that the Island of Ascension is only a little speck in the mighty ocean, it is impossible not to reflect with wonder upon that unexplained instinct which enabled so unwieldy, and apparently so stupid an animal, to find its way back to its former haunts.

There is another wonderful faculty possessed by birds, and probably by animals generally. I mean that of discovering places where food is most abundant, though situate far distant from the spot they had previously occupied. When mice encreased so rapidly in Dean Forest, that they threatened the destruction of the young plantations, and indeed did destroy some of them, birds of prey encreased in proportion. Hawks, owls, and other birds which had not before been known in the neighbourhood, came there in great abundance: and one variety of owl was found there, which had not been seen in the country previous to the appearance of the mice.

I have been assured on the authority of a respectable clergyman residing near Worthing in Sussex, that the Beccafico annually visits the fig orchard

near that place. This is the more extraordinary, as I believe the bird is found in no other part of England. It arrives in the fig orchard in a lean state, just as the figs are ripening, but it soon becomes a lump of fat. It is curious that these birds should perform so long a migration for the purpose of feeding upon figs in one solitary orchard in this country, for I have heard of no other. The Worthing fishermen say that they often alight on their boats when at sea, in an exhausted state. They also assure me that the tit-mouse sometimes does the same, which shews it to be a migratory bird.

That peculiar impulse which induces an animal on a sudden to quit one place for another far distant, which he had never previously visited, is one of those facts which it is more difficult to account for than perhaps any other. Snakes, for instance, will go to considerable distances by water, and will cross even an arm of the sea. A nobleman residing in this neighbourhood informed me, that in passing in his boat between Cowes in the Isle of Wight and the Hampshire Coast, he saw a large snake swimming boldly across that channel. The boatmen assured him that they had frequently witnessed the same circumstance. The fact is also corroborated by Mr. Slight, a Surgeon at Portsmouth. In a letter to Mr. Loudon he says, that a fisherman brought him a snake (Coluber Natrix) which he had caught in his net while fishing in Haslar Lake, one of the branches of Portsmouth Harbour. And on the following morning, he adds, a seaman brought him a second alive and healthy,

which had been just caught from the tide, or landing place, at Portsmouth. In a subsequent communication made to Mr. Loudon from another quarter, it would appear that snakes are frequently seen swimming across the Menai, to and from the Isle of Anglesea, and that they are the common snake of this country. A curious instance is also mentioned of an adder having seized the artificial fly of an angler in one of the lakes of Scotland, on the verge of the estuary of a river. Snakes swim with great vigour, and the fact of their migrating from one place to another cannot, I think, be controverted. The impulse therefore which induces a snake to commit itself to the waves of the sea for the first time, must be extremely powerful.

Since the above was written, the fact of the common land snake being frequently seen swimming in the sea, has been abundantly confirmed to me, during a visit I lately made in the Isle of Wight. Several fishermen I met with there assured me that they had not only often seen them swimming at some distance from land, but that they had taken them while in the act of doing so.

The following property in the snake is not, I believe, generally known. A respectable land-surveyor informed me that while he was making a survey of some property, he was attended by a man who had the character among his neighbours of being a shrewd fellow, but what more particularly entitled him to distinction, was his extraordinary partiality for the common snake. On being questioned on the

subject, he proposed to take the first opportunity which offered of shewing a peculiar property in that reptile. It was on a spring sunny morning, whilst running a line through a copse, that the man in question was observed suddenly to drop the chain handle and jump upon a bank. The next moment he came forward, with two full sized snakes writhing about his hands and wrists. After viewing them some time, while the man admired them with the most lively feelings of satisfaction, he observed, 'I ' know them, sir, (meaning their habits and disposition) ' quite as well as they do themselves.' He then proposed to shew a trait in their character, which would bear out that description of them in Scripture, —viz. that they possessed superior cunning.

On adjourning to a neighbouring road, the man placed one of the snakes on the hard ground. He then took a very thin twig, and tapped the reptile very gently on the head. It immediately darted towards him, when he presented his hand to its open mouth, and continued to play with it, now and then gently tapping it on the head with the twig. He then said that it would dissemble and counterfeit death. This curious effect soon afterwards took place, and the snake to all appearance lay dead. Those who were standing by thought that this was actually the case, but the snake-fancier insisted that it only feigned sleep, and stated that while those present continued to look at it, so long it would remain motionless. On removing to a distance of between twenty and thirty yards, the snake was ob-

served to glide speedily into the nearest hedge. This man confirmed the fact that snakes will emit a stench, *se defendendo*. They appear to have the power of doing this as often as they are subjected to annoyance. On one occasion, and upon one only, the same person saw a snake in the act of casting its skin. He said, to use his own words, that 'it re- 'minded him of a labouring man drawing his round or smock-frock over his head.' He further added, that the head of the reptile was about midway in the old skin, and it extricated itself from the worn out garment, by passing the body through what he called the vent-hole of the old skin. The snake appeared in a very languid and exhausted state, and the new skin was in colour and appearance perfect.

'Those that deny them to breed as other fish do, ask if any man ever saw an *eel* to have a spawn or melt.'

IZAAK WALTON.

VERY little is yet known of the natural history of the eel; indeed, the element in which they live almost precludes us from that access to them which is necessary to enable us to observe their habits and economy. The eel is evidently a link between the fish and serpent, but, unlike the former, it can exist a long time out of water, which its nocturnal migrations prove, though probably a certain degree of moisture on the grass is necessary to enable it to do this. That they do wander * from one place to another is evident, as I am assured that they have been found in ponds in Richmond Park, which had been previously cleaned out and mudded, and into which no water could run except from the springs which supplied it †.

* From the following lines of Oppian, the rambling spirit of eels seems to have been known to the ancients:—

'The wandering eel,
'Oft to the neighbouring beach will silent steal.'

† I have been informed, upon the authority of a nobleman well known for his attachment to field-sports, that, if an eel is found on land, its head is invariably turned towards the *sea*, for which it is always observed to make in the most direct line possible. If this information is correct (and there seems to be no reason to doubt it), it shows that the eel, like the swallow,

An amazing number of eels are bred in the two large ponds in Richmond Park, which is sufficiently evident from the very great quantity of young ones which migrate from those ponds every year. The late respectable head keeper of that Park assured me, that, at nearly the same day in the month of May, vast numbers of young eels, about two inches in length, contrived to get through the pen-stock of the upper pond, and then through the channel which led into the lower pond, from whence they got through another pen-stock into a water-course which led them eventually into the River Thames. They migrated in one connected shoal, and in such prodigious numbers, that no guess could be given as to their probable amount.

An annual migration of young eels also takes place in the River Thames in the month of May, and they have generally made their appearance at Kingston, in their way upwards, about the second week in that month, and accident has so determined it, that, for several years together, it was remarked that the 10th of May was the day of what the fishermen call eel-fair; but they have been more irregular in their proceedings since the interruption of the lock at Teddington. These young eels are about two inches in length, and they make their approach in one regular and undeviating column of about five inches in breadth, and as thick together as it is possible for

is possessed of a strong migratory instinct. May we not suppose that the swallow, like the eel, performs its migrations in the same undeviating course?

them to be. As the procession generally lasts two or three days, and as they appear to move at the rate of nearly two miles and a half an hour, some idea may be formed of their enormous number.

The line of march is almost universally confined to one bank of the river, and not on both sides at the same time; but, from some instinctive or capricious impulse, they will cross the river, and change the side without any apparent reason for doing so. When the column arrives at the entrance of a tributary stream which empties itself into the river, a certain portion of the column will continue to progress up the tributary stream, and the main phalanx either cross the river to the opposite bank, or will, after a stiff struggle to oppose the force of the tributary branch in its emptying process, cross the mouth of this estuary, and regain its original line of march on the same side of the river. In consequence of the young eels dispersing themselves from time to time, as occasion offers, in the manner above described, the shoal must imperceptibly lessen until the whole have disposed of themselves in different places. I have not yet been able to ascertain at what distance from Kingston the shoal has been seen. The locks at Hampton, Sunbury, &c., must however retard their progress upwards.

These young eels are easily taken, and persons who want to stock their ponds with them have only to lower a bucket into the midst of the shoal, which many persons do who reside in the neighbourhood of the river, and a sufficient number is immediately taken to answer their purpose.

There is no doubt but that many of these little animals perish during their progress, but the numbers which are annually taken in our rivers show that a sufficient quantity escape to stock them abundantly.

It is very likely that many eels descend the River Thames, perhaps, as far as the Nore, for the purpose of breeding; a practice contrary to that of some other fish, the salmon for instance, who ascend rivers for the same purpose. This would appear not only from the fact of the large annual shoal of young eels coming up, as above related, but from a circumstance which strengthens my conjecture, and which was communicated to me by one of the Elder Brethren of the Trinity House, a gentleman with whom I have enjoyed many agreeable conversations on natural history and other subjects, and whose society I never quitted without having derived from it increased pleasure and improvement. He informed me that on superintending the laying down of some buoys at some places at the Nore, during a very hot summer, he observed a great number of large eels, which appeared to be dying. on the top of the water; and having occasion to go, soon afterwards, to the mouth of the river which runs into the sea near Harwich, he observed the same thing there, and was then informed that the great and unusual warmth of the water during that hot summer had been the occasion of the death of a great many eels. It is, therefore, I think, pretty clear that these eels (and they were chiefly of a large size) came to the mouth of the

river, probably to the muddy and brackish oozes in the estuary of the Thames, at the latter end of the summer, for the purpose of breeding; and it is probable that, when this is effected, and their offspring have arrived at a certain degree of maturity, an instinctive force prevails, and they are propelled, under the influence of this instinct, to start upwards, and to stock the river as they go along.

Before I quit this part of my subject, it may be as well to mention, for the benefit of all humane persons, that the most effectual and speedy method of killing an eel is by putting it into tepid water.

Eels feed on almost all animal substances, whether dead or living. It is well known that they devour the young of all water-fowl that are not too large for them. Mr. Bingley states, that he saw exposed for sale at Retford, in Nottinghamshire, a quantity of eels that would have filled a couple of wheelbarrows, the whole of which had been taken out of the body of a dead horse, thrown into a ditch near one of the adjacent villages; and a friend of mine saw the body of a man taken out of the Serpentine River in Hyde Park, where it had been some time, and from which a large eel crawled out.

The winter retreat of eels is very curious. They not only get deep into the mud, but in Bushy Park, where the mud in the ponds is not very deep, and what there is, is of a sandy nature, the eels make their way under the banks of the ponds, and have been found knotted together in a large mass.

Eels vary much in size in different waters. The

largest I ever caught was in Richmond Park, and it weighed five pounds, but some are stated to have been caught in Ireland which weighed from fifteen to twenty pounds. Seven pounds is, I believe, no unusual size. The large ones are extremely strong and muscular. Fishing one day at Pain's Hill, near Cobham, in Surrey, I hooked an eel amongst some weeds, but before I could land him he had so twisted a new strong double wire, to which the hook was fixed, that he broke it and made his escape.

Sir Humphry Davy, in his 'Salmonia,' has some curious and interesting observations respecting the eel. He says—'There are two migrations of eels, 'one *from*, and the other *to* the sea; the first in 'spring and summer, the second in autumn, or early 'in winter. The first of very small eels, which are 'sometimes not more than two or two and a half 'inches long; the second of large eels, which some-'times are three or four feet long, and weigh from 'ten to fifteen, or even twenty pounds. There is 'great reason to believe that all eels found in fresh 'water are the results of the first migration; they 'appear in millions in April and May, and sometimes 'continue to rise as late even as July and the begin-'ning of August. I remember this was the case in 'Ireland in 1823. It had been a cold, backward 'summer, and when I was at Ballyshannon, about 'the end of July, the mouth of the river, which had 'been in flood all this month, under the fall, was 'blackened by millions of little eels, about as long 'as the finger, which were constantly urging their

'way up the moist rocks by the side of the fall.
'Thousands died, but their bodies remaining moist,
'served as the ladder for others to make their way;
'and I saw them ascending even perpendicular stones,
'making their road through wet moss, or adhering to
'some eels that had died in the attempt. Such is the
'energy of these little animals, that they continue to
'find their way, in immense numbers, to Loch Erne.
'The same thing happened at the fall of the Bann,
'and Loch Neah is thus peopled with them: even the
'mighty fall of Schaffhausen does not prevent them
'from making their way to the Lake of Constance,
'where I have seen many very large eels.'

Sir Humphry Davy adds, 'that there are eels in
'the Lake of Neufchatel, which communicates by a
'stream with the Rhine; but there are none in the
'Leman Lake, because the Rhone makes a subter-
'raneous fall below Geneva; and though small eels
'can pass by moss, or mount rocks, they cannot pe-
'netrate limestone, or move against a rapid descend-
'ing current of water, passing, as it were, through
'a pipe. Again, no eels mount the Danube from the
'Black Sea, and there are none found in the great
'extent of lakes, swamps, and rivers communicating
'with the Danube, though some of these lakes and
'morasses are wonderfully fitted for them, and though
'they are found abundantly in the same countries, in
'lakes and rivers connected with the ocean and the
'Mediterranean, yet, when brought into confined
'water in the Danube, they fatten and thrive there.
'As to the instinct which leads young eels to seek

'fresh water, it is difficult to reason; probably they 'prefer warmth, and, swimming at the surface in the 'early summer, find the lighter water warmer, and 'likewise containing more insects, and so pursue the 'courses of fresh water, as the waters from the land, 'at this season, become warmer than those of the 'sea. Mr. Couch says (Lin. Trans. part xiv. p. 70) 'that the little eels, according to his observation, are 'produced within reach of the tide, and climb round 'falls to reach fresh water from the sea. I have 'sometimes seen them, in spring, swimming in im-'mense shoals in the Atlantic, in Mount Bay, making 'their way to the mouths of small brooks and rivers. 'When the cold water from the autumnal floods be-'gins to swell the rivers, this fish tries to return to 'the sea; but numbers of the smaller ones hide 'themselves during the winter in the mud, and many 'of them form, as it were, masses together. Various 'authors have recorded the migration of eels in a 'singular way, such as Dr. Plot, who, in his History 'of Staffordshire, says that they pass, in the night, 'across meadows, from one pond to another; and 'Mr. Anderson (Trans. Royal Soc.) gives a distinct 'account of small eels rising up the flood-gates and 'posts of the water-works of the city of Norwich: 'and they made their way to the water above, though 'the boards were smooth planed, and five or six feet 'perpendicular. He says, when they first rose out 'of the water upon the dry board, they rested a 'little, which seemed to be till their slime was thrown 'out and sufficiently glutinous, and then they rose

'up the perpendicular ascent as if they had been 'moving on a plane surface. There can, I think, 'be no doubt that they are assisted by their small 'scales, which, placed like those of serpents, must 'facilitate their progressive motion; these scales 'have been microscopically observed by Lewenhoeck. '(Phil. Trans. vol. iv.) Eels migrate from the salt 'water of different sizes, but I believe never when 'they are above a foot long, and the great mass of 'them are only from two and a half to four inches. 'They feed, grow, and fatten, in fresh water. In 'small rivers they are seldom very large; but in large 'deep lakes they become as thick as a man's arm, or 'even leg; and all those of a considerable size at-'tempt to return to the sea in October or November, 'probably when they experience the cold of the first 'autumnal rains. Those that are not of the largest 'size pass the winter in deepest parts of the mud of 'rivers and lakes, and do not seem to eat much, and 'remain, I believe, almost torpid. Their increase is 'certainly not known in any given time, but must 'depend upon the quantity of their food; but it is 'probable that they do not become of the largest size, 'from the smallest, in one or even two seasons As 'very large eels, after having migrated, never return 'to the river again, they must (for it cannot be sup-'posed that they all die immediately in the sea) re-'main in salt water; and there is a great probability 'that they are then confounded with the conger, 'which is found of different colours and sizes, from 'the smallest to the largest, from a few ounces to

'one hundred pounds in weight. Both the conger
'and the common eel have fringes along the air
'bladder, which are probably the ovaria; and Sir E.
'Home thinks them hermaphrodite, and that the
'vessels for the melt and ova are close to the kid-
'neys. If viviparous, and the fringes contain the
'ova, one mother must produce tens of thousands,
'the ova being remarkably small; but it appears
'more probable that they are oviparous, and that
'they deposit their ova in parts of the sea near deep
'basins, which remain warm in winter. From the
'time (April) that small eels begin to migrate, it is
'probable that they are generated in winter, and the
'pregnant eels ought to be looked for in November,
'December, and January. I opened one in Decem-
'ber, in which the fringes were abundant, but I did
'not examine them under the microscope or chemi-
'cally. The problem of their generation' (Sir H.
Davy adds) 'is the most abstruse, and one of the
'most curious, in natural history; and though it
'occupied the attention of Aristotle, and has been
'since taken up by most distinguished naturalists
'since his time, it is still unsolved, though I trust
'that it will not remain much longer so.'

It is with considerable diffidence that one would venture to differ in opinion with Sir Humphry Davy, but I cannot help remarking, that, as eels are now known to migrate *from* fresh water, this restless propensity may arise from their impatience of the greater degree of warmth in those ponds in the month of May, and not from their wish to get

into water still warmer, as suggested by Sir Humphry Davy.

Very large eels are certainly found in rivers, the Thames and Mole for instance, where I have seen them, so that they must either have remained in them, or have returned from the sea, which Sir H. Davy thinks they never do, though I should add, that the circumstances already related of so many large eels being seen dead or dying during a hot summer, near the Nore, would appear to confirm his assertion.

Since the above was written, I have been shown ova in the lamprey, and what appeared to have been melt taken from a conger eel, at a fishmonger's in Bond-street. These specimens were preserved by Mr. Yarrell, of Little Ryder-street, St. James's, who had the kindness to open two eels, sent to him from Scotland, in my presence, and in which the fringes were very perceptible. That ingenious and indefatigable naturalist is of opinion that eels are oviparous, and he has promised to endeavour to clear up this point, and I shall be delighted if he succeeds. Like many others, I am somewhat sceptical on this subject, and shall be glad to be set right. The fact of the lamprey being oviparous, is not conclusive that the eel is so, it being a cartilaginous fish, and the mouth placed on the under side of the head. In spawning, the lamprey selects a spot about a foot and a half below the surface of the water, and where the stream is rapid, and the ground of sand or gravel. The female makes a hole about two feet deep, working

the sand or gravel away with her tail, which its peculiar formation, having a ridge attached to it, may enable her to do the more readily. This sand is carried away by the current as soon as it is loosened, so that the operations of the fish are very perceptible. The formation of the hole, and the deposition of the ova in it, generally takes up about a week, during which time the female is attended, and sometimes assisted, by the male. When the hole is completed, the male and female enter it, and deposit the melt and spawn. This operation above detailed was witnessed a few days ago (the beginning of June) from Hampton Court Bridge. The opinion expressed by Sir Everard Home (Phil. Trans., 1815, 266), that these fish are hermaphrodites, would seem therefore to be an erroneous one, though it is with considerable diffidence that I venture to say so.

The lampern, or lesser lamprey, is generally supposed to come from the sea early in the year, and, notwithstanding the numerous locks in the river Thames, makes its way, I believe, as far as Oxford. It is caught by the fishermen in those places where the river is most rapid, especially at the entrance of locks. It may sometimes be seen with its mouth apparently fixed to the gravel at the bottom of the river, and I have also frequently observed them adhere to each other by the mouth, when taken from the basket in which they are caught. They live some time out of water.

There are several species of eels in England and Scotland, but I know nothing of those in Ireland.

We have the silver and black eel, and two sorts of each of those, having the head different in shape and size. Some of the eels in Scotland, as well as those in England, have pointed heads, with flatter and wider tails. The grig also appears to be a distinct species. Dr. Mitchell mentions that eels come up to the river Fleet, and as high as Fleet-market, and also up to Walbrook, as far as the water rises with the tide. He also says, that on opening the water-plugs in the streets, six or eight eels of enormous size and activity will sometimes come up; and that they get into the small lead pipes, which conduct the water from the mains to the houses, and will stop them up. On this account a grating is now placed at the entrance of the main pipes to prevent eels from coming from the reservoir.

The following is an extract from Baron Dumeril's lectures on the eel, &c. He is allowed to be the greatest *practical* comparative anatomist living, and he is of opinion that the eel is viviparous. I met with this extract after the above remarks on the eel were written, or it would have been given in another part of this chapter.

Baron Dumeril says—' The genus muræna, or an-
' guillæ species, have all their unequal fins united—
' body round, slippery—skin tough, covered with ex-
' ceedingly small scales. The genus consists of many
' species—their colour varies according to the colour
' of the bottom of the rivulet—in mud, black—in
' gravelly bottoms, greenish-white. Some inhabit
' the sea. They issue from holes which they make

'in the slime, but only at night.* They live upon
'worms. Several species bring forth their young
'alive—*are viviparous,*' &c.

This opinion is confirmed under the article Murænæ, in Rees' Cyclopedia. 'All the species of this
'order differ from many others in the same class by
'their mode of generation, and they stand at the top
'of it in almost all classifications. They are *vivipa-*
'*rous,*' &c.—(Macartney.)

In the Encyclopædia Britannica also, under the same article, is the following passage:—'Among
'those who allow the eel to be produced, like other
'animals, from animal parents which have the sexes,
'some are of opinion that they are viviparous, and
'others that they are oviparous; but Mr. Chartwynd
'seems to have determined this controversy by ob-
'serving, that if the aperture under the belly of the
'eel, which looks red in the month of May, be cut
'open at that time, the young eels will be seen to
'come forth alive after the operation.'

Cuvier, I believe, is not opposed to this opinion, but I have not his work to refer to. It may be added (if the argument of analogy applies in this case), that the animalculæ of paste eels are decidedly viviparous. Mr. Bingley also, in his animal biography, says that eels are viviparous. Blumenbach says, too, that 'ac-
'cording to the most correct observations they are
'certainly viviparous.' He adds also, that the eel is

* I have observed that eels are very much on the move in a rainy day. They are probably aware that worms are more abundant at that time.

so tenacious of life, that its heart, when removed from the body, retains its irritability for forty hours afterwards. I have given these authorities, leaving the subject undecided as to eels being oviparous or not.

I lately met with a passage in an old work on the natural history of Ireland, which confirms what has been said respecting eels going to the sea to deposit their young, and the subsequent migration of these young eels. 'There are many sorts of eels, but the 'silver eels have something peculiar. They come out 'of the sea in the spring, when the salmon fry go 'down to it, and are not bigger than straws, but in 'such quantities, that they have been taken up with 'sieves by the country people, pressed together into 'cakes, and so boiled and eaten; but those who escape 'get up into lakes and brooks, and grow up into their 'full perfection, which may be about two feet in length; 'then in the dark of September moons they come 'down again, and it is reported, by credible persons, 'that whenever the light appears, they stop, sink to 'the bottom, and remain there till it be dark again. 'They are taken in eel-weirs, and sometimes are found 'plaited together in lumps like a mat. When they 'get to the sea, they remain there, and I could not 'learn that they ever return, but their fry come up, 'as was observed before, in the spring.'

'I have seen in the beginning of July, in a river not far
'from Canterbury, some parts of it covered over with *young*
'*eels*, about the thickness of a straw; and these eels did lie on
'the top of that water, as thick as motes are said to be in the
'sun.' IZAAK WALTON.

In my preceding paper on the subject of eels, I mentioned that my kind and ingenious friend, Mr. Yarrell, (to whose acute and able researches every naturalist is so greatly indebted) was of opinion that eels were oviparous, and that he had promised to endeavour to clear up the point. In consequence of that paper, I have had frequent conversations with him on the subject, and it was agreed that I should endeavour to supply him with a large eel for dissection, about once a fortnight throughout that portion of the year in which it was considered that eels matured their roe. This I have accordingly done, having procured one either from the river Thames, or the Longford River which runs through Bushy Park, but generally from the latter, the eels having been taken in a trap at the mill on Hampton Common. Some of these, on one occasion, were dissected by Mr. Yarrell at my house in the presence of several scientific gentlemen, and no doubt remained on the minds of any of those present that what have been called the "fringes" of eels, are in fact roe, each grain or particle being very minute, but quite appa-

rent when seen through a magnifying glass. Mr. Yarrell has been kind enough to write me a paper on the subject, which will be found at the conclusion of this notice, and which I am sure will be read with great interest, and I now beg to offer him my acknowledgement, not only for the assistance he has afforded me on this occasion, but for having directed my attention to other interesting subjects in Natural History.

In order to corroborate as much as possible the fact of eels being oviparous, I will mention the following circumstance. A respectable gardener, and also an old angler, in this neighbourhood, of the name of Sylvester, lately informed me, that as he heard I had been making enquiries respecting eels, he had called to tell me all he knew respecting them. He told me, that fishing one day in the month of March, he caught an eel, about three quarters of a pound in weight, whose stomach was so much distended that he thought it must have swallowed a roach or gudgeon. On returning home he opened it and found it full of roe. On asking him to mention the position and size of the roe, he described it as about the length and almost the size of his finger, running down to the vent on each side of the back bone of the fish, and on describing the fringes to him, which I find our Thames fishermen call the *fat* of eels, he immediately said that the roe was only an enlargement of them. He described the vent of the eel as appearing much inflamed, and the particles of roe as being extremely small, observing that he

thought it would have been discharged in the course of a day or two. The eel was caught on a mild day, otherwise he thought it would have *gone to bed*, as he expressed it; and that it got into the mud, where, as he supposes, they bring forth their spawn. Sylvester offered, if I entertained any doubt of the accuracy of his statement, to make an affidavit of the truth of it before a magistrate.

That eels migrate towards brackish water in order to deposit their roe, I have but little doubt, and for the following reasons. From the month of November until the end of January, provided the frost is not very severe, eels migrate towards the sea. The Thames fishermen are so aware of this fact, that they invariably set their pots or baskets with their mouths *up* stream during those months, while later in the spring and summer they are set down stream. The best time, however, for taking eels is during their passage towards the sea. The eel traps also which are set in three different streams near Hampton Court (the contents of which, at different times, I have had opportunities of examining,) have invariably been supplied with eels, sufficiently large to be breeders, during the months I have mentioned. This migratory disposition is not shewn by small eels, and it may therefore be assumed that they remain nearly stationary till they are old enough to have spawn. I have also ascertained that eels are taken in greater or lesser numbers during the months of November or December, all the way down the river to the brackish water. From thence the young eels migrate, as soon

as they are sufficiently large and strong to encounter the several currents of the river, and make their way to the different contributary streams. I have also been able to trace the procession of young eels, or as it is called here, the *eel fair*, from the neighbourhood of Blackfriars Bridge, as far up the river as Chertsey, although they probably make their way as far, or further, than Oxford. So strong indeed is their migratory disposition that it is well known few things will prevent their progress, as even at the locks at Teddington and Hampton the young eels have been seen to ascend the large posts of the flood gates, in order to make their way when the gates have been shut longer than usual. Those which die, stick to the posts; others, which get a little higher, meet with the same fate, until at last a sufficient layer of them is formed to enable the rest to overcome the difficulty of the passage. A curious instance of the means which young eels will have recourse to, in order to perform their migrations, is annually proved in the neighbourhood of Bristol. Near that city there is a large pond, immediately adjoining which is a stream. On the bank between these two waters a large tree grows, the branches of which hang into the pond. By means of these branches, the young eels ascend into the tree and from thence let themselves drop into the stream below, thus migrating to far distant waters, where they increase in size, and become useful and beneficial to man. A friend of mine who was a casual witness of this circumstance, informed me that the tree appeared to be quite alive with these

little animals. The rapid and unsteady motion of the boughs, did not appear to impede their progress.

When we consider how tenacious eels are of life, and how long they will live out of water, it need not create surprize at their being able to exist during their passage over the tree. The following fact will indeed prove how long a time eels will not only exist, but thrive out of their native element.

A fisherman of the name of Brown, who resides at Kingston on Thames, told me that one evening he brought into his small garden, which was walled round, a pot containing eels. On visiting it the next morning all the eels were gone, and he concluded that they had been stolen. At least a month afterwards, however, he found the eels hidden amongst the turf in a small grass plot in his garden, all perfectly healthy and in good condition. This was in the autumn when there was much dew on the grass. The eels had probably fed on earth worms.

Before I conclude my notice of eels, I wish to mention that there appears to be an hitherto unnoticed species of them found in the river Avon, in Hampshire, where they are called *snigs*. They seldom exceed half a pound in weight, are remarkably good eating, and differ materially in flavour from the common eel, I sent some of them to Mr. Yarrell, who has been kind enough to give me the description of them which will be found in his interesting letter. He is quite of opinion that it is a new species, nor does it appear to have been hitherto noticed. I have been since assured that these fish have invariably

made their movements in the river in a contrary manner to those of the common eel. If eel-pots are set with their mouths down stream for instance, snigs may be caught, but no eels—if up stream, the contrary is the case. This fact alone would appear to show them to be a distinct species.

The eel fair of the year 1832 was particularly abundant, and my kind and intelligent friend Dr. William Roots, who resides on the banks of the Thames at Kingston, has sent me the following notes of observations, which he made at my request, on the appearance and passage of the young eels. These eels are generally about three inches in length, and in order to give some idea of their prodigious numbers, Dr. Roots calculated that eighteen hundred of them passed in the course of a minute when they were at their thickest. Another person whom I employed to make the calculation, informed me that by counting them, while they passed a particular object in the river, he thought there were about sixteen hundred which made their way at the same minute. When one considers the length of time which the column of eels takes in passing, some idea may be formed of their prodigious numbers.

NOTES OF OBSERVATIONS ON THE EEL FAIR, OR FARE, OF 1832.

Monday, April 30th.—In the afternoon of this day Eel Fair became visible at Kingston Bridge, and in about two hours after the young eels appeared at my boat-place and continued to increase in numbers until it was too dark to observe them, they ran up during the whole night, and were very numerous on the next morning.

Tuesday, May 1st.—They continued their line of march in great strength till about four in the afternoon of this day, when they suddenly stopped short, and a few stragglers only were seen till six.

Wednesday, May 2nd.—In the morning of this day they were again seen in considerable quantities pursuing their course which continued till noon, when the wind shifting and getting very high they disappeared altogether for the day.

Thursday, May 3rd.—Several were again seen going up this day also, but for a shorter time and fewer in number.

Friday, May 4th.—A very few stragglers were visible at intervals to day.

GENERAL REMARKS.

It should be observed that some few stragglers (as I call them) had been seen at Twickenham three weeks before, which fact Mr. Kent of Chestnut Grove, related to me when it occurred; but not one of them, even on close observation, was seen to pass the Lock at Teddington at this period. On the first day I saw them (viz. on the 30th of April,) the wind was at north-east, high, cold, and rendering the water very rough: the progress of the young eels was slower than usual, and their appearance was quite unexpected, on account of the cold rough weather without any sunshine.

On the Monday evening, April 30th, I observed some of them endeavouring to bury themselves in the gravelly soil at the margin of the river, but on finding that there was not depth enough for this purpose, the same individuals withdrew their bodies, and continued to make upwards till they came to some soft mud deposited at the mouth of a drain opening into the Thames close to my boat-place. Here many of them buried themselves entirely, and appeared to be thus seeking shelter for a time as the wind was blowing strong, and the current rapid.

Upon my stirring up the mud, hundreds of them

in a small space crawled from the slimy soil, and with great alacrity pursued in every instance their upward course, none of them turning to the right, left, or backwards.

At this time they had hardly moved at the rate of half a mile in the hour, but on the next day at noon, they passed much quicker on account of there being less wind.

I put some of them into spirit, and I found that water heated to one hundred and twenty degrees killed them much sooner than proof spirit; indeed even in this early period of the existence of the eel, the tenacity of life is equally conspicuous as in the more adult state, for even after having plunged them into a basin of pure alcohol, they bounded out, and upon being replaced in water, they lived and appeared to have undergone little or no inconvenience; but water at the temperature of one hundred and twenty degrees speedily annihilated the vital spark.* After the first day of their passing, I could never discover any of them in the slime or mud, as I had observed them on the first evening.

There was by far a larger portion this year, than I had witnessed for a long time before, indeed I may say since the building of the Lock at Teddington, or certainly since the year 1824.

* In a humane point of view, this experiment points out the best and quickest way of putting these creatures out of pain; namely, immersion in water of 120 degrees.

I preserved some of them in spirit, and a large quantity in wire cages in my well-boat, for the purpose of future investigation, but these soon died. I gave notice also to several of my friends, who stocked their ponds from this valuable source of supply.

I endeavoured several times this year to calculate what number passed in a given time, and I took advantage of quiet periods when they were far from being the thickest in the throng, and when of course I could more readily ascertain the number of their ranks in column. I came to the conclusion more than once, and at different places, that there passed under a thread line I extended over the margin of the river more than six hundred young eels in the minute, but in an hour afterwards there must have been more than three times this number, as the wind had fallen, and they moved much more rapidly than when I first averaged their passage: in short, at some periods the quantity was so great, that all calculation was baffled, and the impression on my mind is, that they do not travel more than a mile and a quarter in the hour, even in smooth and shallow water.

I could not detect one instance this year of a single eel leaving or deviating from his up-stream intent. The water being very clear, I had ample opportunities of observing that when I interrupted their course, and turned them for a moment, their main object was evidently bent upon regaining the margin,

and continuing their upward course; in proportion also to the agitation of the water, and the roughness of the wind, so was the depth of their swimming medium determined, coming always nearer to the surface, when the surface was undisturbed, and less impediments offered to their tranquil voyage. In some instances I saw them make their way over some SLIGHT OBSTACLES, as pieces of rush adhering to, or floating close to the shore; but they always appeared aware of any great impeding body, without running at once against it; indeed they universally avoided it when within a few inches of it, and if it protruded so as to make their doubling the promontory of some extent, and thus driving them into more rapid water, they constantly sank lower in proportion as they reached the point, and cutting close to the obtruding end, they again rose to the surface, and having recovered the shore, they made once more for their steady purpose. I observed this instinctive movement from the head of an old punt, half under water, close to my house.

The undulating motion of the eel in swimming is beautifully seen in watching these young creatures;—indeed the whole process of their natural history is well worth much and patient observation.

May 5, 1832. Wm. Roots.

As the term *eel fair* may not generally be understood as applied to the vernal movements of these fish, I may mention that an old custom formerly ex-

isted amongst the Thames fishermen of keeping a sort of holiday on the occasion of the first appearance of the young eels in the river. Indeed the eel was a fish of no small value and importance to them, as they chiefly got their living by catching them in their traps, weirs, and eel-pots, and therefore the annual migration of the young eels was looked upon probably as a fair, or public festivity. On looking, however, into Rees' Cyclopædia, under the article *eel*, it is mentioned cursorily that 'EEL FARES is used 'for the fry or brood of eels.' A *fare* of pigs is a common mode, in the country, of mentioning the number of pigs a sow has recently produced, and is, perhaps the origin of the word farrow. It is not improbable, therefore, that this mention of eel-fares in Rees, may be one and the same thing with our eel-fair of the Thames. I should, however, add that the verb to *fare*, signifies to travel or to voyage, and as the annual performance of the eel is an undoubted act of this nature, *fare* may be a proper term to apply to their migration in this sense of the word.

Having given this little explanation, I must leave it to my readers to decide the question as they may think proper, and will now introduce Mr. Yarrell's very curious and interesting letter to me already referred to.

Dear Sir,

I now send you my promised account of observations on eels, and although it is not, by far, so complete as I could wish, I trust you will excuse

its defects. A London residence is not a favourable position for following up particular parts of the investigation, though I am willing to admit that in some respects it is not without its advantages. Your own observations on eels will, I hope, be in unison with those here detailed, and will serve to illustrate many points in their history, which I have failed to ascertain. Whatever may ultimately prove to be the result of this investigation, it will always be a gratification to me to have been thus joined with you in prosecuting an enquiry into one of the most interesting problems in Natural History.

When I first began to examine eels in the hope of ascertaining their mode of reproduction, so vaguely and differently stated in zoological works, I was induced to believe that their viviparous nature had been inferred, from the circumstance of my finding occasionally one or other of three different sorts of parasitic worms in their intestines, which had probably been mistaken for the young of the eel. One of these species of intestinal worms* is constantly attached to the inner surface of the intestine, as described by you, or rather I should say they have their head imbedded in the substance of the intestine, and can scarcely be withdrawn without the loss of this large and very rounded extremity, the neck being very slender. The second species† is uniform in size throughout its length, not unlike an eel in shape, and is occasionally found in considerable number in va-

* Echinorhyncus tereticollis of Rudolphi.

† A species of Filaria.

rious internal cavities. The third is a species of tænia or tapeworm. Aristotle, though unable to satisfy himself of the existence of the sexes in eels, did not consider them viviparous. One passage in his work may be freely rendered thus, 'eels have 'been considered viviparous, because worms have 'been found in their bodies, which did not belong to 'them.' Lewenhoek searched eels during every month of spring and summer, and found at last in August, in one eel, one example, and in another eel, two examples, of an eel-shaped animal, about the thickness of a horse-hair and an inch in length. On this point Bloch observes 'il est aisé de voir que ces 'expériences pénibles n'ont pas répandu assez de lu-'mière sur la génération des anguilles ; car une mul-'tiplication si modique ne seroit pas, à beaucoup près, 'suffisante pour réparer la déstruction que les hommes 'et les animaux font chaque année parmi les an-'guilles.'

It may be considered singular that an opinion of the viviparous nature of the eel should have found supporters among Ichthyologists, since the decidedly oviparous mode of reproduction in the wolf-fish, sandlaunce, ling, and burbot has been constantly stated and never questioned: four well known species bearing considerable resemblance to the eel in the elongated form of their bodies, and not far removed from them in the classification of systematic authors.

To this I may add that the enormous number of young known to be produced by eels is one of the the best negative proofs that they are oviparous.

viviparous fishes producing, on the contrary, but few young at a time, and these being of considerable size when first excluded.

Since the commencement of my observations on this subject I have had several opportunities of examining large conger eels, the roes of which, towards the latter part of the year, are so conspicuous, as to leave no doubt of the oviparous nature of that species of sea-eel, and although analogy is not always a safe guide in Natural History, it is difficult to suppose that in two fishes so nearly allied as the conger and fresh-water eels, any decided difference would be found to exist in the mode of producing their young. Examination of fresh-water eels of considerable size, at the same period of the year, confirmed this opinion, both sexes were obtained, the females most numerous, the ova distinctly visible in some instances to the unassisted eye, and with the additional power obtained by a lens every successive examination afforded new proof that our fresh-water eels were also in their nature truly oviparous.

Pliny denied sexual distinction to eels; but, says Bloch, 'il dit avec un ton d'assurance, que les anguilles, en se frottant contre des corps durs, font sortir de leur corps de petites parties, qui s'animent et deviennent des anguilles.' This, it will be allowed, is the mode pursued by the truly oviparous fishes.

Bloch says also, that, 'Rondelet soutient qu'elles se reproduisoient comme les autres poissons pourvus de laites et d'œufs. Il disoit que la grande quantité

'de graisse dont la laite et les œufs étoient entourés 'dans les anguilles, empechoit de les apercevoir;' and Lacepede tells us, that Muller, 'et peut-être Mondini, 'ont vu les ovaires ainsi que les œufs de la femelle; 'et la laite du male a été egalement reconnue.'

It is gratifying to be able also to refer to the recorded testimony of other observers of the present day, in corroboration of particular views, which but for such coinciding statements might be considered as resting on too slight an authority. During the last year, two writers, one of them a gentleman, who has for many years paid particular and unceasing attention to the fishes of the Cornish coast; the other evidently detailing in his account the result of much patient investigation, have both published their observations on this subject, and also their decided conviction of the oviparous nature of the eel. The statements referred to will be found in the fifth volume of the Magazine of Natural History, pages 313 and 744, and will be considered good evidence, if not conclusive, on this part of the subject.

I have now, from your most liberal and constant supply, for which I beg you will accept my best thanks, had an opportunity of examining a series of fine fresh eels once every ten days, from the beginning of November last to the present time.

Up to this date, however, the ovaria have not shown any augmentation or other appearance sufficient to induce me to consider that any decided change was about to take place. Occasionally a specimen has occurred in which the ova were larger

than usual, as the numerous preserved portions of the roe of each will exhibit; but in no single instance has the roe been shed. You have noticed the ascent of the eel fry in the Thames as taking place about the middle of May; Dr. Anderson, in his 'Recreations,' describes the same thing as occurring in the Dee, in June, and it was witnessed by the author of 'Salmonia' in Ireland as late as the end of July, and the young eels were then very small. From these circumstances, and the almost torpid state in which eels pass the winter imbedded in mud, of which proof will be adduced, I think it will be found that they do not spawn during the cold months, and I look with more interest to the results of examinations to be made during the next six weeks, when the power of returning spring shall have begun to extend its genial influence to all the living objects by which we are surrounded.

The sexual organ consists of two long narrow sacs extending one on each side of the air-bladder throughout the whole length of the abdominal cavity, and continued for two inches posterior to the vent. The membranes forming this tubular sac, secreting on its inner surface the milt of the male, and affording points of attachment for the ova in the female, is puckered or gathered along the line of its junction to the peritoneal covering of the spine, and its free or loose edge is therefore thrown into creases or plaits, like a frill. It is probably from this folded or convoluted appearance the sexual organs of the eel have frequently been called fringes. By the kindness of my

friends, Mr. Clift and Mr. Owen, of the Royal College of Surgeons, I had lately the pleasure of seeing some drawings belonging to the collection of the celebrated John Hunter, in which these peculiarities of the sexual organs in the eel are beautifully exhibited in various magnified representations.

Most of the writers on the habits of the eel have described them as making two migrations in each year, one in the autumn *to* the sea, the other in spring, or at the beginning of summer, *from* the sea. The autumn migration is performed by adult eels, and it is said to be for the purpose of depositing their spawn; it is also said that these parent fish never return up the rivers. The spring migration is commonly supposed to be confined to very small eels, not more than two inches in length, and in reference to the fry alone, is too well known, and too often recorded, to be matter of doubt. This passage of countless hundreds of young eels has been seen and described in this country by yourself, as occurring in the Thames, and by others in the Dee, the Severn, and the Parret. I am, however, of opinion that the passage of adult eels to the sea, or rather to that part of the river within the tide-way, is an exercise of choice, and not a matter of necessity; and that the parent eels return up the river as well as the fry.

All authors agree that eels are extremely averse to cold. There are no eels in the arctic regions, none in the rivers of Siberia, the Wolga, the Danube, or any of its tributary streams. It is said there are no

eels in the Caspian or Black Seas; but they abound in the Mediterranean, and M. Risso has described eight species in his work on the Natural History of the environs of Nice. There is no doubt also that fishes in general, and eels more particularly, are able to appreciate even minute alterations of temperature in the water they inhabit. The brackish water they seek to remain in during the colder months of the year is of a higher temperature than that of the pure fresh water of the river, or that of the sea. It is a well known law in chemistry, that when two fluids of different densities come in contact, the temperature of the mixture is elevated for a time in proportion to the difference in density of the two fluids, from the mutual penetration and condensation. Such a mixture is constantly taking place in rivers that run into the sea, and the temperature of the mixed water is accordingly elevated. I took the opportunity afforded by a visit to Ramsgate in a steam-boat, to ascertain the extent of this difference of temperature on the passage in September last. The tide was ebbing at London Bridge at 9 A. M. and the temperature of the air was 62°, that of the water 59°. As soon as the influence of salt water was perceptible to the taste the temperature increased, and before we reached Gravesend it was elevated two degrees, namely, 61°, ascertained by a delicate thermometer placed for a time in buckets full of the water drawn up at short intervals. We met the first of the flood tide when approaching the Nore, and from thence the temperature of the water again declined, though that of the

air had advanced considerably. When rounding the North Foreland at 4 o'clock, we met the strong flood-tide from the open channel; the temperature of the pure sea water was precisely the same as that of the pure fresh water, viz. 59°, though the temperature of the air had advanced 9°, and the thermometer in the shade stood at 71°. The mixed water, it appeared, therefore, maintained a temperature 2° higher than that of the river or the sea. This elevation of temperature in the water of estuaries, and the mouths of rivers, is, I have no doubt one reason why they abound in young fish generally; and in reference to its effect on eels, I may mention, that the large congers frequently sent to the London market during the winter months I have repeatedly ascertained by enquiry were caught near Gravesend.

There is some difficulty in the supposition that the eel *alone* of all our river fish should be under the necessity of proceeding beyond the brackish water to deposit its spawn, while from fifteen to twenty species of our marine fishes leave the sea for a time to perform the same function in rivers, but the reason for this latter migration appears obvious. Sir H. Davy, in a note to one of his agricultural lectures, furnishes some interesting information connected with this subject. All animals, says he, from the most to the least perfect classes, require a supply of oxygen. The inpregnated eggs of insects and even of fishes do not produce young ones unless they are supplied with air. He found that the eggs of moths did not produce larvæ when confined in pure carbonic acid;

and when they were exposed in common air the oxygen partly disappeared, and carbonic acid was formed. The fish in the egg or spawn gains its oxygen from the air dissolved in water; and those fishes that spawn in spring and summer in still water, such as the pike, carp, perch, and bream, deposit their eggs upon sub-aquatic plants, the leaves of which in performing their healthy functions, supply oxygen to the water. The fish that spawn in winter, such as the salmon and trout, seek parts where there is a constant supply of fresh water, as near the sources of streams as possible, and in the most rapid currents, where all stagnation is prevented, and where the water is saturated with air, to which it has been exposed during its deposition from clouds. It is the instinct leading these fish to seek a supply of air for their eggs, which carries them from seas or lakes into the mountain country; which induces them to move against the stream, and to endeavour to overleap weirs, milldams, and cataracts.

To this I may add that Dr. Marcet's analysis of one pint of sea water gives upwards of 200 grains as the weight of its solid contents, a pint of fresh water would not afford 20 grains, and the power of water to retain air in combination is inversely as to its other contents. Even the truly marine oviparous fishes seek the shore in their breeding season, that the spawn may have the benefit of the higher temperature of the shallow water of the coast, where the ova are deposited near the sources of oxygen, and within the vivifying influence of the sun's rays.

Dr. Fleming in his 'Philosophy of Zoology,' vol. ii. page 360, has observed that 'when a salt water 'fish is put into fresh water, its motions speedily be- 'come irregular, its respiration appears to be af- 'fected, and unless released it soon dies.' The same consequences follow when a fresh water fish is suddenly immersed in salt water. These experiments have been tried on eels, and with the same results, and in reference to fishes generally, receive further confirmation from the following short account of the destruction of fresh water fish by the admission of the sea into a lake.

The particulars of the phænomena attending the opening of Lake Lothing at Lowestoft to the sea, when sea-borne vessels were first received into the new harbour at that place, on the 3rd of June 1831, are extracted from the East Anglian newspaper of the 7th.

'Some of the circumstances attending the junction 'of the salt and fresh waters, in the first instance, 'are remarkable. The salt water entered the lake 'with a strong under-current, the fresh water run- 'ning out at the same time to the sea upon the sur- 'face. The fresh water of the lake was raised to the 'top by the irruption of the salt water beneath, and 'an immense quantity of yeast-like scum rose to the 'surface of the lake. The entire body of the water 'in the lake was elevated above its former level; and 'on putting a pole down, a strong under current 'could be felt bearing it from the sea; and at a short 'distance from the lock next the lake, there was a

'perceptible and clearly defined line where the salt 'water and the fresh met, the former rushing under 'the latter; and upon this line salt water might have 'been taken up in one hand and fresh water in the 'other.

'The consequence of the admission of the briny 'waters has been fatal to thousands of the former 'inhabitants of the peaceful lake. On wednesday 'and thursday last its surface was thickly studded 'with the bodies of pike, carp, perch, bream, roach, 'and dace, multitudes of which were carried into the 'ocean, and thrown afterwards upon the beach; most 'of them having been bitten in two by the dog-fish, 'which abound in the bay. It is a singular fact that 'pike of about 20 pounds weight was taken up dead 'near the Mutford end of the lake; and on opening 'the stomach a herring was found in it entire. The 'waters of the lake exhibited the phosphorescent 'light peculiar to sea water on the second or third 'night after the opening.'

This will go far to account for the dead eels described by you as seen near the Nore, and at the mouth of the river which runs into the sea near Harwich; I have also known dead eels occur elsewhere, but always at that particular distance from the river, where, with some reference to the existing state of the tide, the fresh water is known to lose entirely its diluting influence. In such a situation by some action of currents or tide, they have probably been suddenly surrounded with pure salt water, and being unable to extricate themselves, or resist its effects,

their destruction has followed. Salmon are well known to remain for weeks about the mouths of rivers before they finally ascend. It appears, therefore, that fishes are unable *suddenly* to accommodate their respiratory organs to fluids of such different density as that of pure sea and fresh water: the blood is imperfectly aerated, the brain suffers, convulsions ensue, and as Dr. Fleming has observed, if not released, they soon die.

The notion entertained by some, that river eels on going to the sea, remain there, and become congers, scarcely requires a serious remark. No person who is accustomed to look for specific distinctions in animals, can fail to observe them when comparing either of our fresh water eels with the conger. These differences, which extend to colour, form of body, and situation of fins, as detailed in works on Natural History, receive further confirmation on examining their internal structure: independent of comparative difference of relative position in some of the most important viscera, the greatest number of vertebræ found in our fresh water eels is 116, those of the conger amount to 156.

That all eels do not quit the rivers during the winter months, your constant supply to me since November last to the present time will sufficiently prove, and I have also ascertained that several large provincial inland towns have had their markets regularly supplied with eels every week during the whole of last winter from the rivers and various waters in their own immediate vicinity. Eels are much more

difficult to catch during the winter months, only because they move much less, and remain for the most part imbedded in mud, as will be more particularly referred to hereafter. The period for quitting their winter quarters, the time of their spawning, and the vivification of the ova, are most probably influenced by the temperature of the season, and that also of the water which they happen to inhabit.

That eels can and do breed in the fresh water of rivers and large ponds is proved by various circumstances. Your own experience and details of the Richmond Park ponds may be quoted in confirmation, and I have been assured by the present keeper of his conviction, that eels constantly breed in those ponds now under his care, and that he has frequently also during summer found quantities of young eels in the smaller ponds and ditches to which they had no access from the Thames.

Dr. Anderson in his recreations in Natural History, vol. vi. page 421, says, 'eels, we know, can 'live and breed in stagnant ponds from which there 'is no outlet, as carp and tench, and several other 'fishes do; but whether they ever there attain the 'same perfection as under other circumstances, may 'perhaps admit of a doubt.'

In the course of my own enquiries on this part of the subject, I have learned that in a large piece of water between Cambridge and Newmarket on the breaking up of a severe frost some winters since, great quantities of eels of all sizes were found dead. No doubt was entertained that these eels had been

bred in the water where they were found, as no outlet existed, by which they could either gain access or egress; and many park and game-keepers with whom I have had opportunities of conversing, were satisfied that eels bred in the canals, lakes, and ponds, under their charge, from which they were able at all seasons of the year to obtain the supplies required for use.

The accounts published of the experiments made by Mr. J. B. Arnold of Guernsey, on the naturalization of sea-fishes in a lake chiefly supplied with fresh water, may be quoted as a further proof of this fact. The area of this lake is about five acres; its depth various, and its bottom also various, being muddy, gravelly, and rocky. The water is during nine months of the year drinkable for cattle, but in consequence of a supply which it receives through a tunnel communicating with the sea, is rather salt in summer, at which season the freshes do not come down so plentifully as at other times. Of the fishes generally, retained in this lake, it is not to my present purpose to speak; of the eels it is stated they have multiplied a thousand fold, so as themselves to produce a considerable revenue; it is easy now to take a cart load at once, where formerly a dozen or two was a large capture.

That eels in great number pass the cold months of the year imbedded in mud, in a state of torpidity, with little or no necessity for food, may be inferred from various circumstances. I have now before me letters from a friend in the country, from which the

following are extracts. 'The season when the great-
'est quantity of eels are taken in this harbour, and
'its rivers, is in winter, when they congregate in
'immense masses in the mud. I have seen half a
'cwt. of eels of various sizes from one pound weight
'to six, taken with a spear, in January, from a space
'not exceeding six feet by twelve.' From another
letter, dated January 20th, 'three men with spears
'took three cwt. of eels on the same spot yester-
'day in half an hour, not one of which was less
'than two pound weight, and many of five: the
'space in which this mass of eels lay was not more
'than about a square rod.' The mud here referred
to is in a large harbour on our southern coast into
which run two rivers. The mud, of great extent,
lies bare, uncovered by water for several hours during
each tide. The eels bury themselves about sixteen
or eighteen inches deep, near the end of the navi-
gable channel, and generally underneath, or close to,
some of the very small land drains, the water of
which runs over the mud into the channel during the
whole time the tide is out. This state of life indi-
cates a low degree of respiration. Dr. Marshall
Hall has shown that the quantity of respiration is
inversely as the degree of irritability. With a high
degree of irritability and a low respiration, co-exist;
1st. The power of sustaining the privation of air,
and of food; 2nd. A low animal temperature; 3rd.
Little activity; 4th. Great tenacity of life. All
these peculiarities eels are well known to possess.
Fishes that swim and take their food near the sur-

face, die soon when taken from the water; trout, dace, mackarel, and herrings, are instances that may be named, on the contrary, those fishes that swim and feed near the bottom, are all tenacious of life, and continue to exist in air for many hours, of which carp, tench, eels, and all the flat fish are familiar examples. One experiment by Dr. Marshall Hall bears particularly on this part of the subject. Some frogs and some eels, were placed in the same vessel of water, through which was placed a very slight galvanic discharge. The frogs were but little affected, the eels were violently agitated. This high degree of irritability of the muscular fibre explains the restless motions of eels during thunder storms, and helps to account for the enormous capture made in some rivers by the use of weirs, gratings, boxes, and pots, which imprison all that enter. The low degree of respiration thus shewn to prevail in eels, also assists them in their occasional progress over land, and the various obstacles that sometimes interfere with their passage, which has been witnessed and recorded by many. I have been assured by fishermen who had no object or interest in deceiving me, that eels frequently leave the Thames, cross the towing path, and have been tracked through the grass of the adjoining water meadows over which they had wandered in search of food. Eels placed in ponds, the water of which is not to their liking, are constantly known to make their escape, and your own observations and enquiries have probably furnished you with other proofs on these points.

It now only remains for me to add a few words on the subject of species.

When I published, in the Zoological Journal, a short description of the differential characters which distinguish our two most common species of fresh water eels: the one as remarkable for having the nose and head sharp and narrow, as that of the other is broad and flat; I was not aware that the circumstance of our having two distinct species had been previously noticed. I ought to have recollected that White, in his History of Selborne, (chap. 40) has the following remark, 'there are supposed to be two 'sorts of eels in the island of Ely;' and having since been referred to Dr. J. Mac Culloch's valuable papers on fishes in different numbers of the Journal of Science, edited at the Royal Institution, I find in No. 38, page 238, the following passage; 'I have also dis-'tinctly ascertained, and to the satisfaction of Baron 'Cuvier, who had been unwilling to admit it, that 'there are two species of fresh water eels, distin-'guished by the comparative acuteness and breadth 'of the nose;' and the difference that appears under the article *Anguille* in the first and second editions of the *Regne Animal*, was probably produced by the communication of Dr. Mac Culloch.

Besides these two species, which are at once distinguished by the difference in the breadth of the nose, the eel you have sent me, obtained from the river Avon in Hampshire, is also distinct from either. In the comparative breadth of the nose it most resembles the sharp-nosed silver eel, and has an elon-

gated depression extending from the anterior edge of the upper jaw to the forehead; the tubular openings of the nostrils are much longer, and the mucous pores about the lips larger and much more conspicuous; the pectoral fins, the commencement of the dorsal fin, and the vent, are each placed nearer the head than in either of our fresh water eels. The general colour, olive green above, inclining to yellow on the sides, and passing into silvery white beneath. Having prepared skeletons of the eels, I find the bones of this new species differ from those of the other eels in one very remarkable particular. The first five cervical vertebræ are smooth and round, entirely destitute of superior or lateral spinous processes, both of which are possessed by the other fresh water eels; with this exception, the skeleton most resembles that of the sharp-nosed eel, but is somewhat stronger, and particularly so in the processes of the other vertebræ generally. This Hampshire eel differs also from the other eels in its habit of roving and feeding during the day, which the other eels do not, seldom moving or taking food except during the night, and even then refusing a bait, if the moon shines bright. The new species is considered excellent as an article of food, and of a superior flavour to other eels; they do not, however, attain a large size, seldom exceeding half a pound in weight, and are known by the term *snigs*.

The largest broad-nosed eel I have ever seen weighed five pounds. I have ascertained that this species exists in the Surrey canal, the Thames, Lea

river, and Stortford navigation canal, and also in Cambridgeshire and Dorsetshire.

They are usually called *grigs* by fishermen and dealers in fish; the former distinguish them readily when fishing at night, by their more soft and unctuous feel under the hand.

The sharp-nosed silver eel sometimes attains a very large size. I saw at Cambridge the preserved skins of two which weighed together fifty pounds, the heaviest twenty-seven pounds, the second twenty-three pounds. They were taken on draining a fen-dyke near that place.

From these detailed observations, I think we are entitled to conclude that eels are oviparous, and that their descent to the brackish water, however general, is not absolutely necessary either for the preservation of old eels, or the production of young ones.

I am, dear Sir,

very sincerely yours,

WM. YARRELL.

Ryder Street, St. James's,
March 13th, 1833.

Dear Sir,

Since the date of my last communication to you I have continued the examinations of eels sent me from various localities by your instructions, and find that in the fresh water the spawn is deposited during the month of April and the beginning of May, with some differences probably depending on soil and temperature. A copy of the dates and notes of these

examinations will furnish you with all the particulars that have been observed by me since the middle of March last.

March 28th.—An eel received from Longford river, the roe very much advanced since the date of the last examination. Part preserved.

April 15th.—An eel from Richmond Park, the roe not shed, but the ova are ready to separate, the connecting membrane had in some places given way, and small detached portions of the spawn were loose in the cavity of the abdomen. The vent enlarged and red. Part of this eel saved as a preparation.

April 17th.—A broad-nosed eel from Godalming, Surrey, from the river Wey, all the roe shed.

April 19th.—Two eels from the Mole and Longford rivers, the roes not shed, but very nearly ready to be discharged, both females, parts preserved.

April 26th.—A second eel from the Wey, (sharp-nosed species) the roe shed.

May 3rd.—Four eels from a large pond in Surrey, sent by the same hand as those from the Wey. All the roes were shed.

May 5th.—Two eels from the Wey, roes shed.

May 7th.—Eel from Hampton, roe shed.

May 18th.—Eels from Sheerness, the roes of which had, as far as I could judge from appearances, been passed some time.

From this date I made no more examinations, and the several portions of the various eels referred to, as preserved in spirit, are now in my possession, for inspection.

When the ova have acquired their greatest size, the belly of the fish, though large and firm to the touch, is not so much distended as I expected to have found it, probably on account of the very elongated form of the ovarium as compared with the same part in other fishes, but the loose and wrinkled state of the skin of the belly in an eel that has shed its roe was most obvious, and the parietes of the abdomen, when cut through, were wasted and thin, and had lost all the firmness at other times so remarkable. I have saved some portions to show this state.

I have now only again to thank you for your bountiful supply of objects for examination, and remain,

Dear Sir,

Your's very truly,

WM. YARRELL.

June 12th, 1833.

'The fly-catcher is of all our summer birds the most mute,
'and the most familiar.——It builds in a vine, or a sweet-
'briar, against the wall of an house, or in the hole of a wall,
'or on the end of a beam, and often close to the post of a
'door.' WHITE'S SELBORNE.

I HAVE now in my possession a curious instance of the habits of the spotted fly-catcher or beam-bird, (muscicapa grisola) in selecting very peculiar and odd situations for building its nest. The nest in question was found on the top of a lamp near Portland Place, London, having five eggs in it which had been sat upon. The top of the lamp was in the shape of a crown, similar to those which may now be seen in Whitehall. The nest was built in the hollow part of it, but perfectly concealed. In consequence of the great heat produced by the gas, the four legs or props of the ornamental crown became unsoldered, and a complaint was made to the authorities for lighting the streets, and the top, with the nest in it, was brought to them. The nest was composed of moss, hair, and some fine grass. It is not a little curious that it should be found in such a situation, and with so great a degree of heat under it. Mr. White says that in outlets about towns, where mosses, lichens, gossamer, &c., are wanting, birds do not make nests so peculiar each to its species. Thus the nest of the chaffinch has not that

elegant appearance, nor is it so beautifully studded with lichens as those in the country; and the wren is obliged to construct its nest with straws and dry grasses, that do not give it that roundness and compactness so remarkable in the usual edifices of that little architect. The nest in question was not lined with feathers and spiders' webs as is generally the case.

I have discovered the fly-catcher's nest on two occasions in odd situations. One of them was behind a decayed piece of bark attached to an elm tree in Hampton Court Park, and the other was concealed amongst one of the ornaments of the beautiful iron gates of Hampton Court Gardens. In Mr. White's unpublished notes, he mentions a fly-catcher having built its nest, in a very peculiar manner, on a shelf fixed to the wall of an outhouse, and behind the head of an old rake lying on the shelf. Indeed the bird would appear to have a partiality for the last mentioned implement, for in Loudon's Magazine of Natural History it is stated that a fly-catcher's nest was built upon a wooden rake lying on the ground in a cottage garden at Barnsford near Worcester. In this nest the female laid eggs, and even sat on them, indifferent to any one passing in the garden, till the nest was taken by a boy belonging to the cottage.

It appears from observations I have made that the fly-catcher is one of the earliest of the migratory birds which leave us. I have missed them a fortnight after they have quitted their nest. It is sur-

prizing that such young and tender birds should have strength sufficient to perform their migration.

While on the subject of nidification, I will mention the following anecdote, not only as illustrative of the habits of a bird of which we have little knowledge, but as a proof of the affection animals are capable of showing for each other, as well as for their offspring. The anecdote was related to me by Mr. Gould, the ingenious author of some of our most splendid and interesting works on Natural History, and which he had an opportunity of witnessing himself at the house of M. Artaria at Manheim.

An African bird, the grenadier grosbeak of Latham, was put into the same cage with a hen goldfinch, in order to try whether they would breed together. This took place, and after they had paired, a quantity of grass and other materials were put into the cage to enable the birds to make their nest. As soon as the hen began to sit, the tropical bird took a quantity of the grass and covered the hen over with it. This he did every day punctually at eleven o'clock, (at which time the sun came upon the cage) and apparently for the purpose of screening her from its heat. It is not improbable therefore, that in very hot countries, birds show this mark of attention to their mates. It may however be done for the purpose of concealing them from the sight of birds of prey, or other animals, which might either molest or destroy them. The male of this species of grosbeak is of a brilliant scarlet colour

during the breeding season, (and hence his name of grenadier by some, and cardinal by others) but it changes to brown afterwards. Its size is that of a Linnet.

'The fearful doe
And flying stag amidst the greyhounds go'
DRYDEN'S VIRGIL.

In addition to the herd of fallow deer, amounting to about one thousand six hundred, which are kept in Richmond Park, there is generally a stock of from forty to fifty red deer. Some stags from the latter are selected every year, and sent to Swinley, in order to be hunted by the king's stag hounds. When a stag, which has been hunted for three or four seasons, is returned to the park, to end his days there, he is generally more fierce and dangerous than any of the others at a particular season of the year. At that time it is sometimes not safe to approach him; and the keepers inform me, that they have been obliged to fire at them with buck shot, when they have been attacked by them. They account for this ferocity, by the circumstance of the deer having been much handled, and consequently rendered more familiar with, and less afraid of, those whom they would naturally shun. It is sometimes very difficult to take stags for hunting. One fine stag was so powerful, and offered so much resistance, that two of his legs were broken in endeavouring to secure him, and he was obliged to be killed. One who had shown good sport in the royal hunt was named 'Sir Edmund,' by his late Majesty, in consequence of Sir

Edmund Nagle having been in at the '*take*' after a long chase. This stag lived some years afterwards in the park; and it is a curious fact that he died the very same day on which Sir Edmund Nagle died. This deer herded with the cows, probably from having been so long separated from his usual companions.

Does are longer lived than bucks. One doe in Richmond Park lived to be twenty years old; and there are other instances of their having attained the same age.

A curious circumstance lately occurred, respecting the red deer in the park in question. In the year 1825, not a single calf was dropped by any of the the hinds, though they had bred freely the preceding, and did the same in the subsequent year. I find an event recorded in the 'Journal of a Naturalist,' as having happened in the same year in regard to cows. It is there stated that for many miles round the residence of the author, scarcely any female calves were born. The diminution of the usual breed of deer, and the increase of sex in another animal, is not a little remarkable.

There is a fine breed of buck-hounds in Richmond Park, and their sagacity is very extraordinary. In taking the deer, according to annual custom, either for the royal hunt or for the fattening paddocks, a stag or a buck, which has been previously fixed upon, is ridden out of the herd by two or three of the keepers in succession, each of whom is closely followed by a hound, the young dogs only being kept

in slips. As soon as the deer has been separated from his companions, the dogs have the requisite signal given to them, and they immediately follow in pursuit. The scene then is highly interesting. A strong deer will afford a very long chase, but when he comes to bay, the dogs generally seize him by the throat or ears; the keepers come up, take him by the horns, and after having strapped his hind and fore legs together, put him into a cart which follows for the purpose, and he is then disposed of as he may be wanted. I have seen an active young keeper throw himself from his horse upon a deer at bay, which he had come up to at full gallop, and hold his horns till assistance arrived. Some danger, however, attends this sport; as, when a deer has been hard pressed, I have seen him in more than one instance, suddenly turn upon the horsemen and injure the horses, and in one case wound the leg of the horseman. The dogs are so well trained, and are so soon made aware which buck is intended to be caught, that they seldom make a mistake, even if the deer regains the herd after having been driven from it, but press him through it, till they have again separated him from it. It is well known that when a hard-pressed deer tries to rejoin his companions, they endeavour to avoid and get away from him as much as possible, or try to drive him away with their horns. So severe is the chase in Richmond Park in taking deer, especially when the ground is wet, that three or four good horses may be tired by a single horseman in one day's deer taking, if each deer is ridden out of the

herd, and followed till he is taken. When dogs are in slips, the man who holds them merely rides as near as he can to the person who is endeavouring to single out the deer, and awaits his signal for slipping the dogs. These dogs, which are a large, rough sort of greyhound, and very powerful and sagacious, are soon taught not to injure the deer when they come to them. The cry of 'hold them,' made use of by the keepers in urging them forward, seems to be perfectly understood by the dogs.

The keepers in some of the king's parks have a method of taking hares alive, which I never saw practised elsewhere. When they want to lessen the number of male hares, they look for a hare in its form, and when found, they ride round it in a circle. They continue to do this for some time; and if the hare keeps her seat, two men walk up on each side of her, holding a net spread out between them. At a given signal, they drop it, and the hare is caught. If it is a female, it is again turned loose.

Hares will try and find each other by the scent, as we see dogs hunt. I have disturbed a hare from her seat in the spring during the breeding season, and when I have retired to a little distance, I have seen her followed, when she was no longer in sight, by a male. He has evidently traced her by the scent: and when he has been at fault, I have observed him make a cast, and hunt his ground as a dog would do, till he has again hit off the right way, and followed with the greatest eagerness. I have

been assured by a person who witnessed it, that six or seven weasels have joined together, and have pursued a rabbit by the scent, not exactly in full cry, but uttering a sort of whine while they were in pursuit.

Where the soil and herbage agree with hares, they increase with amazing rapidity. In Hampton Court Park, where they have no shelter, and where many leverets are destroyed, in consequence of horses and cows trampling upon them, they thrive, nevertheless, better than in any place I am acquainted with. In coursing them, they run nearly, if not quite, as strong as down hares. As there is no cover for them to retreat to, they take refuge, but only when hard pressed, either in old rabbit holes, or in drains, and holes in trees. I have observed in coursing, that if a hare, when she is started from her form, has her ears down, she is a weak runner, but if one of her ears is carried erect, the hare generally beats the dogs.

Hampton Court and Bushy Parks were used as hare parks in the time of Oliver Cromwell; and the healthy state of the hares in them at this time will account for their having been fixed upon for that purpose. In Richmond Park, where the soil and herbage are of a different nature, hares are subject to disorders which in some years carry off great numbers of them. In Kew Gardens, where the soil is dry, both hares and pheasants are very abundant.

Within the memory of some of the old persons residing in Richmond Park, squirrels were in such vast numbers, that parties of fifty or sixty persons have come from the metropolis and its neighbourhood, for the purpose of killing them. They were furnished with short sticks, with lead at one end, with which they knocked the animals down. These squirrel hunts occasioned many fights with the keepers, in one of which, a keeper, of the name of Bishop, was nearly killed. The squirrels were in consequence destroyed, and it is now but seldom that one is seen.

OUR VILLAGE.

' Sweet was the sound when oft, at evening's close,
' Up yonder hill, the village-murmur rose;
' There as I pass'd, with careless steps and slow,
' The mingling notes came soften'd from below;
' The swain responsive as the milk maid sung,
' The sober herd that low'd to meet their young,
' The noisy geese that gabbled o'er the pool,
' The playful children just let loose from school,
' The watch-dog's noise that bay'd the whispering wind,
' And the loud laugh that spoke the vacant mind;
' These all in sweet confusion sought the shade,
' And fill'd each pause the nightingale had made '

There is something very pleasing in rural sounds and rural objects. The noise of village boys playing at cricket, the cawing of rooks in a still evening, the distant tread of a horse, the sheep bells, even the village clock, are all pleasant. I like to see cows going to be milked, and inhale with satisfaction the fresh and fragrant perfume which one perceives as they pass by. Those that have calves are always in advance, and show their impatience to reach their

young, by an occasional bellow, and a short run, and then a sudden stop to listen whether they can hear the call of their calves. If they do, how eagerly do they advance to the gate of the farm-yard, and show the utmost anxiety to have admittance. The clean, well-scoured milk-pails and churns, are no unsightly objects, and while the process of milking is going on in a well littered farm-yard, the cows quietly chew the cud, and appear contented and happy. Those, however, which have been recently deprived of their young ones, show a reluctance to give down their milk, and many retain some of it, from a maternal feeling that their offspring may require it.

In the spring one hears the wild whirl of a number of sparrows as they rapidly pass by, and then settle in some neighbouring bush, or hedge, chirping and scolding one another, till some culprit who has been pursued, again takes flight and is again followed with the same clamorous noise. This is succeeded by the song of the thrush on the top of some high elm tree, and later in the evening the nightingale makes himself heard.

> 'Ten thousand warblers cheer the day, and one
> 'The livelong night.'

On a fine summer's day we hear the tinkling of pans and shovels, to persuade a hive of bees to settle in some cottage-garden, and are pleased even with the whetting of scythes in a neighbouring field. The gobbling of a turkey-cock, the peevish call of a guinea-fowl, and the cry of pigs for their evening

food, are far from being unpleasant sounds to those who delight, as I do, in the country.

> 'The village church, among the trees,
> 'Where first our marriage vows were given,
> 'With merry peals shall swell the breeze,
> 'And point with taper spire to heaven.'—ROGERS.

I like also a village church. The peasant enters in his clean smock-frock, smooths down his hair, says, or appears to say, a word in his hat, which he carefully and deliberately hangs up, and then leans with crossed arms over the door of the pew till the service begins. Both before and after church he may be seen standing with his back against the low wall of the churchyard, with perhaps the hand of a favourite child in his, talking over some village news. As the squire or the clergyman pass by, he touches his hat to them with respect and affection, and in the evening he may be seen with his cottage-door open, drinking tea with his wife and children, and then sauntering about with them either in his garden or some village lane.

The good old squire hobbles out of church, leaning on the arm of his daughter, and kindly inquires after the welfare of all about him. He sends food and money to the sick and needy, makes up quarrels as a magistrate, maintains a well-ordered Sunday-school, and promotes the happiness of his villagers by every means in his power. If on returning from church he meets a smoking dinner going to a cottage from the village bake-house, he generally slips a shilling into the hand of the bearer, for the purpose, as he

says, of washing the dinner down with a little good ale. I must, however, add that the old gentleman sometimes slyly takes a good-looking potato out of the dish, which he eats with evident satisfaction.

But how shall I describe our curate? his sunny, good-humoured face is never seen without delight by young and old, rich and poor. He joins in the village sports, and is a famous hand at cricket, and even condescends sometimes to play at trap ball with the boys, who hail his arrival with great glee. He visits and assists all who want relief, and is never wearied in doing good. He always considers it a bad sign if one of his poor parishioners passes him without touching his hat, or seems to avoid meeting him. He then with great tact and kindness takes himto task. I have heard him say that he is sure to find that the man has either been foolishly spending his money in the alehouse, or his mind has been tainted by listening to the speeches of some radical demagogue in the neighbouring town. In either case he mildly endeavours to convince the culprit of the folly of his conduct, and generally succeeds in setting him right.

To all this good feeling, our curate has a mind stored with learning, and with a taste for the fine arts. He, moreover, dabbles a little in antiquities, and takes great delight in his naturalist's calendar, in which he makes observations equally agreeable and instructive.

Such was our village a few years ago, but, alas! alas! how it has been changed since! A travelling

politician has been lecturing in one of our barns, and has made our poor labourers discontented, and consequently idle. All the influence of the good curate has not been able to stem the torrent, and he is about to quit the village in despair of doing any further good. The poor old squire has already left it, after having lowered his rents so much, that he could no longer afford to live with his usual kindness and hospitality. He has therefore abandoned his estates, his tenants, and his labourers to the care of a mercenary bailiff, and is gone to reside in an overgrown town on the sea coast, upon the residue of a once ample income.

I consider the aspect of this town as one of the most melancholy features of the present times. It is now resorted to by many under the same circumstances with our squire, by those who ought to have made every sacrifice to stem the torrent of disaffection, who should have given up their horses, their carriages, their hospitalities, sooner than quit their villages and country-houses, and sever the tie which connected them with their tenants and labourers. They may hope to return in better times, and to replace things on their former footing. But that tie once broken cannot be restored, and it is melancholy to reflect on the consequences.

> 'O favoured land! renown'd for arts and arms,
> 'For manly talents and for female charms,'

where shall we find a country like thee! Giving, as you have done, a tone to the morals, the energies,

and public faith of all other countries, whom shame alone has forced to endeavour to imitate your bright examples, how dangerous is the position in which you are now placed! Those whose example should influence the morals and conduct of the peasantry, are congregating in the metropolis, and destroying their time, and health and fortune, in folly and dissipation. The peasantry are badly employed and badly paid,* and the appropriation of the poor's rates is generally left to mercenary farmers and interested shopkeepers. While the poor are thus neglected, they become careless of consequences, hardened, and disaffected. They marry, because they find that a married man receives more parish relief than they do, though perhaps the single man is the best workman; and the parish is burthened with the maintenance of their children.

I have lived all my life in the country, and am well acquainted with the character of the English peasantry. Instances of profligacy and ingratitude may no doubt sometimes occur amongst them; but treat them as they ought to be treated—give them employment, and pay them properly for the work they do—

'Let labour have its due!—my cot shall be
'From chilling want and guilty murmurs free.

* There can be no doubt of the poor labourers in this country being inadequately paid. A kind-hearted landlord, or clergyman, lowers his rent or tithes, and the farmer pockets the amount, without rendering a proportionate assistance to his workmen.

'Let labour have its due!—then peace is mine,
'And never, never, shall my heart repine.'

And give them also that moral and religious instruction and example which they have a right to expect from those whom Providence has placed in a situation superior to themselves—and I will venture to assert that a more orderly, grateful, and better-conditioned peasantry would not be found on the surface of the globe.

I am aware that the subject of this chapter has nothing to do with Natural History; but I was unwilling to lose this opportunity of stating my conviction of what is likely to take place, should the poor be abandoned to their own resources, while the rich and powerful are either forgetful of their wants and miseries, or are absenting themselves from the homes of their forefathers, and seeking for pleasures in the metropolis or watering-places. If they do neither of these, they are imbibing foreign habits and manners in foreign lands, and disqualifying themselves for undertaking the duties and enjoyments of an English country life.

Do not, however, let me be misunderstood. In speaking of the neglect experienced by the poor in many places, I am aware that amongst the rich and powerful of the land there are to be found numerous examples of disinterested charity and boundless benevolence. Where time, and talents, and money have been employed, as they often are, in administering to the wants, and in bettering the condition of the poor, the beneficial results are always to be seen

in the well-being, orderly conduct, and gratitude of the peasantry. Disaffection, and riots, and burnings were to be found only in those places where the fostering hand of kindness had been withdrawn.

· the Shepherd's homely curds,
'His cold thin drink out of his leather bottle,
'His wonted sleep under a fresh tree's shade,
'All which secure and sweetly he enjoys,
'Is far beyond a Prince's delicates.' SHAKSPEARE.

THE welfare of the agricultural peasantry is one of those subjects which will always interest a naturalist. It is indeed intimately connected with almost everything which makes the country delightful to me, and enhances the pleasure of my rural walks. To be greeted with smiling, happy faces; to see the inside of cottages clean and orderly, the outside decorated with flowers, and well-cultivated, flourishing gardens, never fail to produce sensations of pleasure and satisfaction. If, in addition to this, I find a thriving pig in a sty, I know that the family is doing well, and that the head of it is a hard-working, industrious man. Happily, some such cottages may still be seen in almost every village in England; affording to the neighbourhood a useful and instructive example of the benefits to be derived from sobriety and industry.

I think that I am well acquainted with the habits and characters of the peasantry of this country. I lose no opportunity of gaining information respecting them from the best sources, and I see all who call upon me either for relief or work; there are not a

as my official sit
nately afforded me the opportunity of giving employment to many. I wish I could add that the result of these enquiries was a satisfactory one; but it is a fearful truth, that both the moral and the physical condition of our peasantry is getting worse and worse. And what is the cause of this? Is it from want of employment? I have seldom found an instance of a steady, hard-working man, of sober, industrious and honest habits, who could not get work, and who was not fairly paid for it. It is not from over taxation and the dearness of the necessaries of life, because nine shillings a week will go further to maintain a family now, than twelve shillings a week would a few years ago. But haunts of vice, and facilities for drunkenness, have been multiplied to a frightful degree in every town and village in England. Those, also, whose examples should check the vices, and improve the moral condition of the poorer classes, are, on the contrary, poisoning the sources from which their own wealth, their power, and even their subsistence are derived. Whenever the tie which unites the rich and poor is broken, the consequences must be formidable. And is it not on the point of being separated? Is it made closer by good example, by abstaining from those vices which are condemned in the poorer classes, and by constant endeavours to improve their moral condition? As long as this is not the case, let us not expect too much from the labourer. He will generally follow the example of his more prosperous neighbour, whether for good or

bad, and will find an excuse for his own profligacy, or neglect of what is right, accordingly.

In those villages where attention has been paid to the morals and well-being of the labourers, the most beneficial results may be seen. The beer-shops are less frequented, the poor-rates are low, the church is well attended; and the labourers have but little to complain of; indeed, they appear happy and flourishing; a proof of this may be seen in a village with which I am well acquainted. Owing to the exertions, in the first instance, of one individual, poverty has been almost excluded from the place; every one looks happy and contented, and the village itself is a picture of neatness and prosperity. The church has been repaired and enlarged, school rooms have been built, and various improvements made in the village, and all by voluntary subscriptions, some of them by persons not even residing in the parish, but who were desirous of aiding the exertions of the individual referred to. I should add, that endeavours are making to do away with the necessity of church-rates, an example which I should be glad to see followed in other places.

An adjoining parish offers an example of the effects of bad management. The tradesmen meet on parish business at an ale-house in the evening, many of them generally half drunk. They are headed by an attorney, who has involved the parish in law-suits, and driven every respectable person from the vestry-meetings. The poor-rates are enormous, the church-rates high in proportion, and the parish is overwhelmed with debts and unemployed poor.

I have mentioned these two parishes because they afford proofs of the effects of good and bad management. In the former, one active and intelligent gentleman, co-operating with some respectable farmers and tradesmen, has been the means of effecting all the good I have mentioned. In the latter case, interested shop-keepers have generally had the disposal of the parish funds, the poor have been neglected, and the whole place is a picture of poverty and wretchedness. I cannot imagine two villages which afford a more striking contrast, and they adjoin each other.

If the middle and higher classes of society were aware how materially they are interested in the well-being of the poor, and that the value of English soil will always be in proportion to the prosperity of the English peasantry, they would perhaps interest themselves more than they have done in promoting the welfare of the agricultural labourers. I know some estates, the rental of which is eat up by poor-rates, and the poor, notwithstanding, are in a wretched condition. By alloting portions of these badly cultivated and unprofitable estates to the unemployed labourers, much might have been done towards improving their condition, and, consequently, in reducing the poor-rates. A labourer who has a moderate-sized garden and orchard attached to his cottage, will, with very little assistance, generally contrive to feed himself and his family, and be able to keep a pig: indeed, I know from actual observation that this is the case. I lately went over a district in Berkshire,

where each cottage had its garden and orchard, and it was a real pleasure to me to witness the comfort and prosperity of the owners of them. Under an Act of Parliament for enclosing the w ste lands of the district I have referred to, an allotment in severalty was attached to each cottage, which could not be alienated, and the good effects may now be seen. In fact, if a peasant is placed in a situation which will make him depend for a certain portion of his subsistence on the produce of land which he cultivates, he will very rarely apply for relief from the poor-rates.

It is much to be regretted that this was not the case under each of the enclosure acts which the legislature have passed. The interests of the poor, as well as those of the rich, as has since been lamentably proved, would then have been properly attended to. I consider, however, that the enclosure acts generally have been the greatest curse which could have been heaped upon the poor; and I quite agree with an able writer, because I know it to be a fact, that in almost every instance the increase of poor-rates has kept pace visibly with the progress of inclosures.

How well do I recollect going with my excellent mother, when I was a boy, to visit some cottages on the edge of an extensive common near her residence. The owner of each of them had his flock of geese and other poultry, a few sheep, and now and then a cow; and a donkey to convey the eggs, poultry, fruit and vegetables to a neighbouring market. The garden was studded with fruit-trees, bee-hives, and flowers; and the inside of the cottage was a pic-

ture of neatness and happiness. Well do I recollect, also, the little grateful offering of some honey-comb, or a few of the best apples, in return for some attention to a sick child, or other kindness shewn to them by my mother. One worthy couple had two sons and five daughters, all of whom were well brought up, and all did well in the world; and, at their death, the old people contrived to leave £120 to be divided amongst their children. The husband was a day labourer, and I am persuaded that not only he, but any of his poor neighbours, would have thought it as great a disgrace to have accepted relief from the poor-rates, as to have been sent to jail. The common has now been enclosed some years, and all the prosperity of the cottagers has disappeared. It is a melancholy sight, and may, without going further, be attributed to the enclosure of a common from which the labourers derived so much of their means of subsistence. People have been in the habit of decrying the advantages which the poor derived from the exercise of their common-rights; but it has been well observed, that, to him who has, and who fortunately wants but little, a trifle is of importance; this *trifle* amounted, probably, to half the subsistence of the man's family. Whenever labour was slack, he had always something in reserve, upon which he could profitably employ himself.

Another great curse which the legislature has brought upon the poor, is owing to the beer-shops, the haunts of vice and profligacy. Those who frequent them are not only generally poisoned with

drugged beer, as is notoriously the case, but every inducement is held out to procure customers, such as gaming, skittles, &c. The beer-shops are generally supplied by brewers, so that little has been gained in doing away with their monopoly. *If the legislature had made it imperative upon every one who opened a beer-shop, not only to brew his own beer, but to brew it on his own premises, much evil would have been avoided.*

Differing as I do from Mr. Cobbett * in his politics, I must say that he has been of great use to the poor. His "Cottage Economy" gives them hints and advice which have, and continue to be, of the greatest service to them: it contains a little mine of wealth, of which the poor may reap the advantage; for no one understands the character of the English labourer better than Mr. Cobbett. It is painful to think in how many instances the poor have been deprived of the little they had; and he who has nothing is always ready for change and novelty, in hopes of getting something.

It is not, however, too late to better the condition of the English peasantry: much may still be done to make up for the injustice of which they have been the victims. It is but little they want, and that little constituted their happiness till they were deprived of it. It may be thought by some that a peasant is un-

* Since this was written Mr. Cobbett is no more Whatever his faults may have been (and who is without them) he was an Englishman of the old school. His Cottage Economy should be considered as his Legacy to the poor.

acquainted with the term, but I am more and more convinced that happiness is more equally divided than we are aware of: a poor man, with a sufficiency for his support, is quite as happy, if not happier, than one who has all the anxiety which wealth brings with it.

> Bene est, cui Deus obtulit
> Parca, quod satis est, manu.

When we look back to the history of the English labourers; when we peruse the account which old writers have drawn of them; and when we call to mind what they did, and were capable of doing, when their energies were called forth, we cannot but see what a melancholy reverse has taken place: indolent in their habits, depressed from poverty, having little to lose and much to hope for, they present a picture which every lover of his country must dread to look at. It may be thought to be overdrawn, but I appeal to every one who is acquainted with the present state of the English peasantry, whether this is the case. I am speaking generally, because there are still some cheering instances which prove how much may be done by good management, by proper encouragement, and well applied kindness.

I have already mentioned my opinion of the good which may be done by giving a labourer a small allotment of land. This applies more particularly to those who are not capable of great exertion in either task or day-work. a garden is then a great resource. But an able-bodied labourer, who is sober and prudent, and determined to do his utmost to maintain himself

and family, will find nothing equal to his own good right arm, and willing heart. Such a man can always command employment, and will always do well. I am able to give an instance of this. A man, with whom I am well acquainted, married, and had a large family, consisting of four sons and three daughters. His wages, as a day-labourer in a garden, were fifteen shillings a week, and he occasionally got a trifle in addition by brewing for two or three families. His wife now and then earned something by washing. With these means, and by their prudence, industry, and good management, they not only contrived to feed and clothe their children, but each of them was taught to read and write. The good example of the parents influenced the conduct of their offspring. They all went into service, and all of them are now settled in the world and doing well. It is one of the little pleasurable circumstances of my life that I have been able to procure a situation for the old man, which has made him happy and comfortable. I often visit him at the little hut in which he sits in the day-time, ready to open and shut a gate, and generally find him employed in reading. It is a pleasure to see his open, cheerful and grateful countenance. It was only the other day he told me, when I was talking to him about the good conduct of one of his sons—'to be sure,' said the old man, 'it was sometimes hard work to 'bring them all up; but,' he added with an honest smile, 'I have now saved up enough to leave them 'all a trifle.'

Another man, who has hardly his equal in my

neighbourhood as a sober, steady and good workman, was born with only his right hand. Under this apparently disadvantageous circumstance he contrives to earn a good living at either task or day-work. He trenches and drains ground, fells trees, makes stack-wood and faggots, and, in short, does whatever any other labourer can do. The termination of his left arm is very pliable, and he contrives to use it so as to find but little inconvenience from the want of fingers. This man is so steady and industrious, that he maintains and brings up his family with comfort, and never is in want of work. I have mentioned these two instances to prove how much may be done by persevering industry and good conduct, under the disadvantage of a large family, and bodily infirmity,

They may serve my readers as examples for them to shew to an English labourer what may be done, even in these depressing times, if he will but rightly apply those energies with which he is endowed. Above all, he must avoid the ale-house and the beer-shop as he would a pest-house. They help to impoverish his family, and, mainly assist in rendering his daily task irksome to him. Instead of that cheerfulness, which almost turns toil into pleasure, and that open manly look which I delight in seeing in a well-conditioned workman, he skulks to his work, depressed alike in mind and body. It is a great mistake to think that beer is necessary for a hard-working man. At the time I write, there are a set of men employed in draining, by task-work, in Richmond Park, who are patterns of English labourers. Hard

as they work from morning to night, and in all weathers, they seldom drink any beer. They boil a large kettle of coffee in their little bivouac in the park, and drink it hot at their meals. This costs them but little; but they do as hard a day's work upon it as any labourers in England, and have continued to do so for three years past under all the disadvantages arising from wet and cold to which a drainer is subject. A proof of this may be found in Captain Ross' recent voyage to the arctic regions. He says that on a journey attended with great difficulty and hardship, he was the only one of the party whose eyes were not inflamed, and he was the only only one who did not drink grog. He was also the oldest person amongst them, and, for the same reason, he bore fatigue better than any of them. He adds, that he who will make the experiment on two equal boats' crews, rowing in a heavy sea, will soon be convinced that the water-drinkers will far outdo the others. No better testimony to this is required than the experience of the men who work in the iron founderies. That is the hardest work which falls to a man to do; and so well do the labourers in this department know that they cannot perform it if they drink even beer, that their sole beverage, during all the hours of this hot and heavy labour, is water.

If a labouring man, who is in the habit of frequenting the ale-house, was to put down every week what his gin and beer cost him, he would find the amount, at the end of the year, very considerable.

It would have bought him a good cow, or several pigs. It would have been much more than the rent of his cottage. It would have made his family comfortable, and even respectable in their appearance. Whenever I see poverty and rags in the cottage of an English labourer, I invariably find that the owner of it indulges himself in the profligate practice of tippling at an ale-house. It is, indeed, fearful to think how much the working and vicious part of the English spend in gin alone. It amounts to several millions a year; and it is well ascertained that the use of it not only degrades the poor, and renders them discontented, but it has divested pauperism of its shame, and the workhouse of its disgrace.

In writing thus, it is impossible not to call to mind the circumstances which have operated to render the labourer improvident. The free circulation of money from the year 1795 to 1815, a period of twenty years, did not tend to foster frugal and self-denying habits, and I would therefore look with great indulgence on the failings, and even vices, of the working classes. The great thing now to be done, is, to endeavour to bring them back, gradually, to a sound and wholesome state. Much may be done by private individuals to better the condition of the labourer, or rather to assist him in bettering his own condition. Proprietors of property, whether landed, funded, or commercial, are all deeply concerned in giving encouragement to the poor, This may be effected by allotting them small portions of land at a fair rent, by loans of small sums, and by

seconding, by subscriptions, their savings in summer, to enable them to purchase fuel and other necessaries in winter at a cheap rate. If something of this sort is not done, and if the new poor-law bill (the boldest and wisest measure which an administration could bring forward), is not enforced with the utmost tenderness and discretion, I venture to predict that a volcano will burst forth amongst the agricultural labourers, which will destroy, with its overwhelming effects, this fair and beautiful country.

TREE PLANTING.

So much has been lately said respecting Sir Henry Stewart's method of transplanting large trees, that I am induced to mention a method I have adopted in some of his Majesty's parks, which has been attended with great success, and which, I believe, will be found to be infinitely cheaper, and more generally to be depended upon, than the plan of Sir H: Stewart. I tried the experiment on rather a large scale this spring (1831), in Bushy Park, and under every disadvantage, as I was not able to begin the work till the second week in March, and there was rather a long continuance of cold dry weather after the plants had been removed. Of some hundreds of trees which were taken up and replanted, not one had died, though many of them were of a large size, and some of them laurels from ten to twelve feet in height, shewing their blossom at the time they were transplanted, which was not at all checked by the operation.

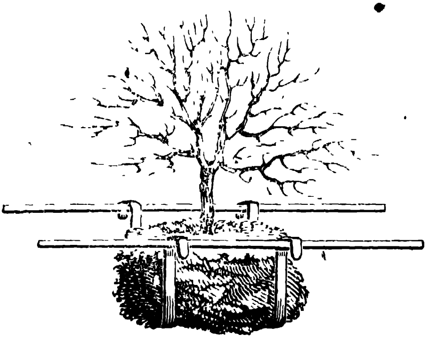
The plan I adopted is as follows. In the first place, the earth must be excavated at some distance from the tree leaving all the principal fibres, and the earth adhering to them, in a compact ball, undermining it as much as possible, and taking care not to shake or injure the ball by twisting the stem of the

tree, or using it as a lever to loosen the tap roots. When this has been done, and a corresponding hole made at the place to which the tree is intended to be removed, the following method of taking it up and conveying it is to be used.

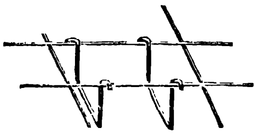
Two pieces of iron must be previously formed, of the breadth and thickness of a common cart-wheel tire, three or four inches wide, and rather more than half an inch in thickness, and about six feet long, bent in this form,



which will reduce it to three feet across. This size will do for trees requiring from two to four men to lift them; but a size larger and stronger in proportion will be wanted for trees, which will require from



eight to ten or more men to carry them. Put these irons under the ball of earth, as near the centre as possible, leaving a space between them of about two feet, and for larger trees a little more. Run two strong poles about eight or ten feet long, and three or four inches in diameter, and smaller at each end, and apply them, as shown in the sketch, to each side, passing them through the bends of the irons, so as to form a complete hand-barrow. The tree may then be readily lifted. Cross levers may be used for larger trees which require more men, thus,—



so that as many men can conveniently apply their strength to it as are wanted, without being in each other's way. The whole is fixed and unfixed without any loss of time, and requires no tying, nor is there any danger of its slipping off. One of the chief advantages of this method is, that the tree is supported on the ball of earth, instead of the earth being supported by the fibres, as is usual in most cases. Even in moving large trees with trucks, sledges, &c., most of the mischief is done in loading and unloading, and in adjusting the tree to a proper position, which can all be done by the above method, without in the least injuring the fibres, &c. The roots which

extend beyond the ball are cut off at the outer or further side of the trench, and are left projecting.

In taking up the tree, it is advisable to go much wider with the spade *from* it, than the ball is intended to be. The size of the ball may be afterwards reduced with a pick, so that scarcely a root will be materially injured. In planting, spread the projecting roots out carefully in different layers, as near as possible to their original position, as the hole is gradually filled up with mould.

The best way of forming the ball is to prepare it the year before the tree is to be taken up. This is to be done by digging round it, and cutting most of the principal roots. This has been long practised with success; but where this precaution has not been taken, the above method will be found preferable to cutting the roots close to the side of the ball of earth.

In removing very large trees, such of the tap and other large roots which cannot conveniently be got at may be separated by means of a long chisel, which can be readily applied under the ball of earth. In moderate-sized trees, however, this is not required.

Having mentioned this plan of planting, it is only fair to add, that the trees I have removed are not so large as those described by Sir H. Stewart. Had it, however, been necessary for me to have planted larger trees, I have no doubt but that I should have succeeded equally well; as by means of the cross levers, the strength of a proportionate number of men may be readily applied.

Having stated that I consider my plan preferable to that of Sir H. Stewart, I will now give my reasons for saying so. In the first place, it is cheaper.

I have ascertained this by comparing the expense which it cost a gentleman to plant some moderate-sized trees on Sir H. Stewart's plan, with what it cost to plant an equal number on my own, and I found that I could do it much cheaper.

In the second place, I consider my plan more successful in preserving the lives of the trees, and more generally applicable to every description of tree and shrub—large laurels, for instance, the fibrous roots of which cannot be exposed without destroying the tree. Elms, which are very tenacious of life, will succeed well by either plan; and with common care may be transplanted of a large size. Oaks, beech, Spanish chestnuts, and birch do not soon recover from the exposure of their roots. Hollies also of some years' growth suffer from it. By taking these trees up in the manner I have described, they do not appear to feel the removal.

Lastly, I do not find that any of the trees which I have thus planted require support, as the large ball of earth steadies them sufficiently.

'I have now brought my 'Gleanings' to an end, and quit them with regret. When I think of the many happy hours I have passed in contemplating the works of a beneficent Creator, I can look back upon them as neither mis-spent nor unprofitable. The gratification I have derived in viewing what is

beautiful in nature—my pleasant walks by some clear and lively stream, and my strolls through woodland scenery, cannot better be expressed than by quoting the following poetical language by the author of Salmonia, with which I will conclude.

'How delightful it is in the early spring, after the 'dull and tedious time of winter, when the frosts 'disappear, and the sunshine warms the earth and 'waters, to wander forth by some clear stream, to 'see the leaf bursting from the purple bud, to scent 'the odours of the bank perfumed by the violet, and 'enamelled as it were with the primrose and the 'daisy; to wander upon the fresh turf below the 'shade of trees, whose bright blossoms are filled 'with the music of the bee; and on the surface of 'the waters to view the gaudy flies sparkling like 'animated gems in the sunbeams, whilst the bright 'and beautiful trout is watching them from below, 'to hear the twittering of the water-birds, who, 'alarmed at your approach, rapidly hide themselves 'beneath the flowers and leaves of the water-lily; 'and as the season advances, to find all these objects 'changed for others of the same kind, but better 'and brighter, till the swallow and the trout contend 'as it were for the gaudy may-fly, and till in pur'suing your amusement in the calm and balmy 'evening, you are serenaded by the songs of the 'cheerful thrush and melodious nightingale, per'forming the offices of paternal lo.e, in thickets 'ornamented with the rose and woodbine.'

MAXIMS AND HINTS FOR AN ANGLER,*

BY A BUNGLER.

[Not inserted here as sure guides, but loosely thrown out, in order to provoke contradiction, and elicit truth from the expert.]

I.

ARE there any fish in the river to which you are going?

II.

Having settled the above question in the affirmative, get some person who knows the water to show you whereabouts the fish usually lie; and when he shows them to you, do not show yourself to them.

III.

Comparatively coarse fishing will succeed better

* A friend of mine, with whom I have enjoyed many an agreeable day's fishing, and whose excellence of heart and mind, as well as his attainments in the science of the angle, would have procured him the friendship of Izaak Walton, had he lived in his time (which, luckily for myself and his other friends, he did not), has allowed me to introduce the following shrewd and pithy remarks on Fly-fishing, written by him in the Album of a celebrated Fishing Club. E. J.

when you are not seen by the fish, than the finest when they see you.

IV.

Do not imagine that, because a fish does not instantly dart off on first seeing you, he is the less aware of your presence: he almost always on such occasions ceases to feed, and pays you the compliment of devoting his whole attention to you, whilst he is preparing for a start whenever the apprehended danger becomes sufficiently imminent.

V.

By wading when the sun does not shine, you may walk in the river within eighteen or twenty yards below a fish, which would be immediately driven away by your walking on the bank on either side, though at a greater distance from him.

VI.

When you are fishing with the natural May-fly, it is as well to wait for a passing cloud, as to drive away the fish by putting your fly to him in the glare of the sunshine, when he will not take it.

VII.

If you pass your fly neatly and well three times over a trout, and he refuses it, do not wait any longer for him: you may be sure that he has seen the line of invitation which you have sent over the water to him, and does not intend to come.

VIII.

If your line be nearly *taught*, as it ought to be, with little or no gut in the water, a good fish will

always hook himself on your gently raising the top of the rod when he has taken the fly.

If you are above a fish in the stream when you hook him, get below him as soon as you can; and remember that if you pull him but for an instant against the stream, he will, if a heavy fish, break his hold; or if he should be firmly hooked, you will probably find that the united strength of the stream and fish is too much for your skill and tackle.

X.

I do not think that a fish has much power of stopping himself if, immediately on being hooked, he is moved slowly with the current, under the attractive influence of your rod and line: he may then be at once brought, by a well-regulated exercise of gentle violence, to the bank, from whence he is to be instantly whipt out by an expert assistant, furnished with a landing net, the ring of which ought not to be of a less diameter than eighteen inches, the handle of it being seven feet long.

XI.

If, after hooking a trout, you allow him to remain stationary but for a moment, he will have time to put his helm hard a-port or a-starboard, and to offer some resistance. Strong tackle now becomes useful.

XII.

Bear always in mind that no tackle is strong enough, unless well handled. A good fisherman will easily kill a trout of three pounds with a rod and line which are not strong enough to lift a dead

weight of one pound from the floor, and place it on the table.

XIII.

Remember that, in whipping with the artificial fly, it must have time, when you have drawn it out of the water, to make the whole circuit, and to be at one time straight behind you, before it can be driven out straight before you. If you give it the forward impulse too soon, you will hear a crack. Take this as a int that your fly is gone to grass.

XIV.

Never throw with a long line when a short one will answer your purpose. The most difficult fish to hook is one which is rising at three-fourths of the utmost distance to which you can throw. Even when you are at the extent of your distance, you have a better chance; because, in this case, when you do reach him, your line will be straight, and, when you do not, the intermediate failures will not alarm him.

XV.

It appears to me that, in whipping with an artificial fly, there are only two cases in which a fish taking the fly will infallibly hook himself without your assistance, viz.:

1. When your fly first touches the water at the end of a straight line.

2. When you are drawing out your fly for a new throw.

In all other cases it is necessary that, in order to hook him when he has taken the fly, you should do

something with your wrist which it is not easy to describe.

XVI.

If your line should fall loose and wavy into the water, it will either frighten away the fish, or he will take the fly into his mouth without fastening himself; and when he finds that it does not answer his purpose, he will spit it out again before it has answered yours.

Although the question of fishing up or down the stream is usually settled by the direction of the wind, you may sometimes have the option; and it is, therefore, as well to say a word or two on both sides.

1. If, when you are fishing down stream, you take a step or two with each successive throw, your fly is always travelling over new water, which cannot have been disturbed by the passing of your line.

2. When you are fishing up-stream, you may lose the advantage of raising so many fish; but, on the other hand, you will have a better chance of hooking those which rise at your fly, because the darting forward of a fish seizing it has a tendency to tighten your line, and to produce the desired effect.

3. If you are in the habit of catching a fish sometimes, there is another great advantage in fishing up-stream, viz. whilst you are playing and leading (necessarily down stream) the fish which you have hooked, you do not alarm the others which are above you, waiting till their turn comes.

XVIII.

The learned are much divided in opinion as to the propriety of whipping with two flies or with one. I am humbly of opinion that your chance of hooking fish is much increased by your using two flies; but I think that, by using only one, you increase your chance of landing the fish.

XIX.

When you are using two flies, you can easily find the bob-fly on the top of the water, and thus be sure that the end-fly is not far off. When you are using only one fly, you cannot so easily see where the fly is: but I think that you can make a better guess as to where the fish is likely to be after you have hooked him.

XX.

Also, when you are using two flies, you may sometimes catch a fish with one of them, and a weed growing in the river with the other; when such a *liaison* is once formed, you will find it difficult, with all your attractions, to overcome the strong attachment of the fish to your worthless rival the weed.

XXI.

"If the weed will not give way in the awkward juncture above alluded to, you must proceed to extremities. 'Then comes the tug of war;' and your line is quite as likely to break between you and the fish, as between the fish and the weed.

XXII.

When, during the season of the May-fly, your friends, the gentlemen from London, say that they

'have scarcely seen a fish rise all day,' do not too hastily conclude that the fish have not been feeding on the fly.

XXIII.

The only 'rising' which is seen by the unlearned is the splash which is made by a fish when he darts from a considerable depth in the water to catch an occasional fly on the surface. There is, however, another sort of 'rising,' which is better worth the skilful angler's attention, viz.—

XXIV.

When a fish is seriously feeding on the fly, he stations himself at no greater depth than his own length; and making his tail the hinge of his motions, he gently raises his mouth to the top of the water, and quietly sucks in the fly attempting to pass over him. A rising of this sort is not easily seen, but it is worth looking for: because, although a fish feeding in this manner will rarely go many inches on either side for a fly, he will as rarely refuse to take one which comes (without any gut in the water) directly to him.

XXV.

If your fly (gut unfortunately included) should swim over a fish without his taking it, look out well for a darting line of undulation, which betokens his immediate departure; and remember that it is of no use to continue fishing for him after he is gone.

XXVI.

The stations chosen by fish for feeding are those which are likely to afford them good sport in catch-

ing flies; viz.—1. The mouths of ditches running into the river:—2. The confluence of two branches of a stream, which has been divided by a patch of weeds;—3. That part of a stream which has been narrowed by two such patches;—4. Fish are also to be found under the bank opposite to the wind, where they are waiting for the flies which are blown against that bank, and fall into the river.

XXVII.

If, during your walks by the river-side, you have marked any good fish, it is fair to presume that other persons have marked them also. Suppose the case of two well-known fish, one of them (which I will call A) lying above a certain bridge, the other (which I will call B) lying below the bridge. Suppose further that you have just caught B, and that some curious and cunning friend should say to you in a careless way, 'Where did you take that fine fish?' a finished fisherman would advise you to tell your inquiring friend that you had taken your fish just *above* the bridge, describing, as the scene of action, the spot which, in truth, you know to be still occupied by the other fish A. Your friend would then fish no more for A, supposing that to be the fish which you have caught: and whilst he innocently resumes his operations below the bridge, where he falsely imagines B still to be, A is left quietly for you, if you can catch him.

XXVIII.

When you see a large fish rising so greedily in the middle of a sharp stream, that you feel almost sure

of his instantly taking your May-fly, I would advise you to make an accurate survey of all obstructions in the immediate neighbourhood of your feet—of any ditch which may be close behind you—or of any narrow plank, amidst high rushes, which you may shortly have to walk over in a hurry. If you should hook the fish, a knowledge of these interesting localities will be very useful to you.

XXIX.

When your water-proof boots are wet through, make a hole or two near the bottom of them, in order that the water, which runs in whilst you are walking in the river, may run freely out again whilst you are walking on the bank. You will thus avoid an accompaniment of pumping-music, which is not agreeable.

XXX.

Never mind what they of the old school say about 'playing him till he is tired.' Much valuable time and many a good fish may be lost by this antiquated proceeding. Put him into your basket *as soon as you can*. Everything depends on the manner in which you commence your acquaintance with him. If you can at first prevail upon him to walk a little way down the stream with you, you will have no difficulty afterwards in persuading him to let you have the pleasure of seeing him at dinner.

XXXI.

Do not be afraid of filling your pockets too full when you go out, you are more likely to leave something behind you than to take too much. A man who seldom catches a fish at any other time,

usually gets hold of one (and loses him of course) whilst his attendant is gone back for something which had been forgotten.

XXXII.

If your attendant is a handy fellow at landing a fish, let him do it in his own way; if he is not, try to find a better man, or go home. Although so much depends upon his skill, you will rarely derive much comfort from asking him for his opinion. If you have had bad sport, and say to him, 'Which way shall we go now?' he will most probably say, 'Where you please, sir.' If you ask him what he thinks of the weather, he is very likely to say that last week (*when you were in London*) it was 'famous 'weather for fishing;' or he will perhaps say, that he expects that next week (*when you are to be at home again*) it will be very good. I never knew one of these men who was satisfied with the present hour.

XXXIII.

Do not leave off fishing early in the evening because your friends are tired. After a bright day, the largest fish are to be caught by whipping between sunset and dark. Even, however, in these precious moments, you will not have good sport if you continue throwing after you have whipped your fly off. Pay attention to this; and if you have any doubt after dusk, you may easily ascertain the point, by drawing the end of the line quickly through your hand,—particularly if you do not wear gloves.

XXXIV.

No attempt is here made to give directions as to

the best seasons for cutting the woods which are fittest for the making of rods, or as to the mode of preparing them; because the worst rod which is kept for sale at the present day is probably as good as the best of the first few dozens which any amateur is likely to make for himself.

XXXV.

Lastly—When you have got hold of a good fish, which is not very tractable, if you are married, gentle reader, think of your wife, who, like the fish, is united to you by very tender ties, which can only end with her death, or her going into weeds. If you are single, the loss of the fish, when you thought the prize your own, may remind you of some more serious disappointment.

R. P.

Rod Cottage, River-side, 31st May, 1829,

POSTSCRIPT.

I FORGOT to say, that, if a friend should invite you to his house, saying that he will give you 'an excellent day's fishing,' you ought not to doubt his kind intention, but you certainly ought not to feel very sure that you will have good sport. Provide yourself for such a visit with every thing which you may want, as if you were going into an uninhabited country. Above all things, take a landing net with you. Your friend's (if he has one) is problably torn and without a handle, being a sort of reticulated

shovel for taking fish out of the well of a punt. Take warning from the following story.

Mr. Jones and Mr. Thompson went last week to the house of Mr. Jenkins, for a few days' fishing. They were received with the utmost kindness and hospitality by Mr. and Mrs. Jenkins, and on the following morning, after breakfast, the gardener (who was on that day called the fisherman) was desired to attend them to the river. Thompson, who had a landing-net of his own, begged to have a boy to carry it. Jack was immediately sent for, and he appeared in *top* boots, with a livery hat and waistcoat.

Arrived at the water-side, Thompson gave his gnat basket to the boy, and told him to go on the other side of the river, and look on the grass for a few May-flies. Jack said that he did not exactly know what May-flies were, and that the river could not be crossed without going over a bridge a mile off. Thompson is a patient man, so he began to fish with his landing-net for a few May-flies, and after he had necessarily frightened away many fish, he succeeded in catching six or seven May-flies.

Working one of them with the blowing line much to his own satisfaction, and thinking to extract a compliment from his attendant, he said, 'They do not often fish here in this way—do they?' 'No,' said the boy, 'they drags wi' a net; they did zo the day afore yesterday.'

Our angler, after much patient fishing, hooked a fine trout; and having brought him carefully to the

bank, he said, ' Now, my lad, don't be in a hurry, but get him out as soon as you can. Jack ran to the water's edge, threw down the net, and seizing the line with both hands, of course broke it immediately.

Nothing daunted, Thompson now mended his tackle and went on fishing; and when he thought, ' good easy man,' that the very moment for hooking another trout was arrived, there was a great splash just above his fly;—and the boy exclaiming, ' Damn 'un, I missed 'un,' instantly threw a second brickbat at a rat which was crossing the river.

Mine host, in order to accommodate his friends, dined early; and when they went after dinner to enjoy the evening fishing, they found that the miller had turned off the water, and that the river was nearly dry,—so they went back to tea.

R. P.

PRINTED BY W. NICOL, PALL-MALL.

WORKS

OF

NATURAL HISTORY.

SALMONIA; or, DAYS of FLY-FISHING. A Series of Conversations on the Art of Fly-fishing for the Species and Varieties of the Salmon, and on the Habit of these Fishes. By the late Sir HUMPHRY DAVY Third Edition. With Engravings and Woodcuts. Small 8vo. 12s.

CONSOLATIONS in TRAVEL; or, The LAST DAYS of a PHILOSOPHER. By Sir HUMPHRY DAVY, late President of the Royal Society. *Fourth Edition.* f. c. 8vo., printed uniformly with 'Salmonia.' 6s.

The JOURNAL of a NATURALIST. *Third Edition.* Post 8vo., with numerous Additions and Improvements, Plates and Woodcuts. 15s.

——— Plants, trees, and stones, we note;
Birds, insects, beasts, and many rural things.

"It is a book that ought to find its way into every rural drawing-room in the kingdom, and one that may safely be placed in every lady's boudoir, be her rank and station in life what they may."—*Quarterly Review*, No. 78.

ELEMENTS of GEOLOGY, for the Use of Beginners. By CHARLES LYELL, Esq., F.R.S., F.G.S., Author of the "Principles of Geology." With numerous Views and Diagrams, explanatory and illustrative; and figures of Fossils. 1 Vol. 12mo.

PRINCIPLES of GEOLOGY; with a GLOSSARY, containing an Explanation of Scientific Terms, and a copious Index. By CHARLES LYELL, F.R.S. *Fifth Edition*, revised and enlarged, illustrated with 226 Wood-cuts and 16 Plates and Maps. 4 vols. 12mo. 28s.

The "SILURIAN REGION," and ADJACENT COUNTIES of ENGLAND and WALES. Geologically illustrated; including Salop, Hereford, Radnor, Montgomery, Brecknock, Caermarthen, Pembroke, Monmouth, Worcester, Gloucester, and Stafford. By RODERICK IMPEY MURCHISON, F.R.S., Vice-President of the Geological Society, F.L.S., Hon. Mem. R.I.A., &c. &c. 2 Vols. royal 4to. With large Geological Map, Views, Coloured Sections, and numerous Plates of Organic Remains. Price, 5 *guineas* to Subscribers; 8 *guineas* to the Public.